



Weeds
and
Useful Plants.

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AMERICAN WEEDS AND USEFUL PLANTS:

BEING A

Second and Illustrated Edition

OF

AGRICULTURAL BOTANY:

AN

ENUMERATION AND DESCRIPTION OF USEFUL PLANTS AND WEEDS, WHICH
MERIT THE NOTICE, OR REQUIRE THE ATTENTION OF
AMERICAN AGRICULTURISTS.

BY WILLIAM DARLINGTON, M. D.

Hic Segetes, illic veniunt felicius Uvæ :
Arborei fetus alibi, atque injussa virescunt
Gramina. VIRGIL, GEORG. 1.

Here golden harvests wave, there Vineyards glow,
Fruit bends the bough, or Herbs unbidden grow.
SOTHEY.

REVISED, WITH ADDITIONS, BY

GEORGE THURBER,

PROF. OF MAT. MED. AND BOTANY, ETC., IN THE N. Y. COLLEGE OF PHARMACY.

NEW YORK:

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EDWARD O. JENKINS,

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TO THE YOUNG FARMERS

Of the United States,

THIS HUMBLE ATTEMPT

TO AID AND PERSUADE THEM

TO CULTIVATE A DEPARTMENT OF SCIENCE

ESSENTIAL TO AN ENLIGHTENED AGRICULTURE,

AND

INDISPENSABLE TO AN ACCOMPLISHED YEOMANRY,

Is respectfully dedicated by

THE AUTHOR.

EDITOR'S PREFACE.

A new edition of Doct. Barnard's *Agrostology* having been called for, and as the author, at his advanced age, felt indisposed to undertake the labor of a revision, the work was placed in my hands to prepare for the press with the author's permission to make such changes and additions as might seem desirable. Such alterations have been made in the botanical arrangement, and names as the advances of the science required, and descriptions have been added of such plants not included in the former edition as are generally known as weeds. Besides these I have noticed the common medicinal plants, and such of our native shrubs as are worthy of cultivation—those that are both ornamental and easily obtained. These latter may not strictly come within the scope of "weeds," but are introduced with the hope of inducing farmers to render the exterior of their homes more attractive by surrounding them with beautiful shrubbery, which once planted will be a permanent source of gratification not only to the possessor, but to travelers who pass them. The grade of our country, whether generally barren or fertile, has been taken into the account often made to cultivate a few choice domestic plants rather injudicious than necessary.

In the introduction of new plants, the plan of the original work has been continued to, and the descriptions of those are taken from *Barnard's Flora Carolina*, where that work contained them; in other cases those in *Torrey's Flora of the State of New York* and *Gray's Manual of the Botany of the Northern States* have been used.

I am exceedingly indebted to Prof. Gray for permission to use his Analytical Key to the Natural Orders, and have modified it as well as some of his Synopses of Orders and Genera, to suit the present work. Doct. G. W. Snow, of Kentucky, has kindly furnished names of some of

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In the introduction of new plants, the plan of the original work has been conformed to, and the descriptions of these are taken from Darlington's *Flora Cestrica*, when that work contained them; in other cases, those in Torrey's *Flora of the State of New York*, and Gray's *Manual of the Botany of the Northern States* have been used.

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the troublesome plants of the West, which have been acknowledged in the proper places. I am also indebted to I. A. LAPHAM, Esq., for his offer, which came too late to be available, to furnish notes upon the weeds of Wisconsin. The more important illustrations in the work are from original drawings, by ANTHONY HOCHSTEIN, Esq., whose delicate sketches have hardly justice done them by being rendered in wood. The most of his drawings are designated by his initials. The remainder of the engravings were obtained from the best available sources. My friend, Mr. FRANK A. POLLARD, has rendered me most essential aid, both before and during the rapid printing of the work, which I would gratefully acknowledge.

Where new observations or other matter has been added, or the old ones essentially modified, a * has been appended. This, however, has been omitted where the alterations are unimportant; in these cases any faults may be placed to the account of the editor.

NEW YORK, *January 31st*, 1859.

PREFACE TO THE FIRST EDITION.

AGRICULTURE, in a broad and legitimate sense, being a comprehensive system of Natural Science—involving more especially a practical acquaintance with the useful portion of the Vegetable Creation,—I have long thought it due to the Profession, and desirable in every point of view, that the young Farmers of the United States should acquire an exact knowledge of the Plants which it immediately concerns them to know; and that they should be enabled to designate, and treat of them, with the precision and methodical perspicuity which belong to scientific language and arrangement. Under this impression, and in the hope of promoting an object deemed so important, the present work has been compiled. In submitting it to those for whom it is more particularly intended, I am not unaware that its technical features are ill-suited to the notions of many plodding disciples of the old school of Agriculture, who despise every form of knowledge derivable from *Books*,—and whose ideas never stray beyond the manual operations of the field and the barn-yard. It is scarcely probable, indeed, that any written treatise—though couched in the most familiar dialect—would obviate the objections, or conciliate the prejudices of such antiquated tillers of the soil. My views, therefore, have not been directed to that unpromising quarter. I address myself to the youthful and aspiring Agriculturists of our country, who seek to elevate their noble Profession to its just rank among human pursuits,—and who feel that the exercise of *intellect*, as well as of muscle, is indispensable to the accomplishment of their purpose.

I have preferred to treat of the Plants, which it more immediately behoves the farmer to be acquainted with, according to the most approved *method* of our day, and in the *language* of Systematic Botany. By exhibiting as much of the classification, or frame-work of the Science, as is requisite to present the Genera and Species, here described, in their natural and relative positions, the Student will be enabled to comprehend their connection with the other portions of the System, and to examine them, as the Geologists say, *in situ*. In that process, he will necessarily have to learn something of their structure, and essential character; and *that* I should consider as an important advantage,—even if his researches should there terminate. His knowledge, however limited, will be established on a correct basis,—and will be always available in his intercourse with men of science: but, to those who may subsequently resolve upon a more extended acquaintance with the vegetable kingdom, such knowledge will be a clear gain, and a valuable pre-

liminary step;—that step which, according to the proverb, is the only one which costs.

In adopting the machinery of Science,—preferring the botanical to the popular names of plants, as well as arranging them in kindred groups—I have supposed that such a plan would be most conducive to accuracy of conception,—and would, in fact, facilitate the investigation of their true character. By employing names and phrases which have an exclusive application, and a definite meaning, the study of plants is really simplified; and the knowledge acquired—being thereby communicable with more readiness and precision—is greatly enhanced in practical value. By using, everywhere, the same terms in the same sense, men of different regions, or districts, can be sure that they comprehend each other's meaning,—and may then discuss questions understandingly. When disputes arise, touching the merits or demerits of particular plants, both parties will have clear conceptions of the objects referred to,—and will consequently have the advantage of knowing exactly what they are talking about:—which is far from being always the case when they make use of a variable popular nomenclature.

It is a great mistake, in my opinion, to suppose that the significant language of our Science must necessarily be merged in the vernacular idiom, or degraded into a local *patois*, in order to adapt it to the capacities of intelligent practical men. An active intellect, I think, more readily acquires *new terms*, appropriate to a Science, than *new meanings* of old familiar words: and hence it is that most persons, as they advance in any department of knowledge, are apt to discard all equivocal terms, and to substitute those which are definite, technical, and peculiar. Instead, therefore, of *writing down* to the level of boorish apprehension, I would rather see Agricultural works gradually *written up* to the scientific standard. I would have our young Farmers taught to appreciate the importance of scientific precision, and incited to take their appropriate position in the intellectual community.

In the present work, it is hoped and believed that with the aid of the copious *Glossary*, the *Index of Common Names*, and the other facilities annexed, there can be no difficulty in becoming familiar with the terms employed, nor in the investigation of the plants enumerated:* and the farmer who shall have accomplished that much, will find that he has obtained many new and interesting views of objects intimately connected with his Profession,—that he has acquired a capacity for observing and profiting by numerous processes and phenomena

* As a convenient and satisfactory mode of acquiring the requisite Botanical knowledge—and of keeping that knowledge always within reach, in case of forgetfulness,—I would recommend to the young Farmer the formation of a select *Herbarium*, containing authentic specimens—neatly prepared and appropriately labelled—of those plants which it is his interest to be acquainted with. Such a collection could readily be obtained by every one who has the taste, or even the curiosity, to extend his information in that direction. It would afford instructive subjects for investigation and comparison, in seasons of leisure; and the contents, being duly arranged, could be examined or referred to, with the like facilities and advantages as attend the consultation of a Dictionary.

in the vegetable economy, which had theretofore been unheeded, or imperfectly understood. A spirit of research will often be awakened, which, in itself, is an unfailing source of gratification to ingenuous minds,—and not unfrequently leads to important practical results.

The study of BOTANY, in its widest sense—comprising, as it does, the entire vegetable creation,—will ever have its select votaries in those who can appreciate its manifold charms, and find their reward in the pleasures incident to the pursuit: But when regarded in a more limited and practical point of view, it may fairly challenge the attention even of the most inveterate *Utilitarians*. There are *three* aspects, or relations of the Science, in which its importance will scarcely be denied by the most penurious calculator of economical values: namely, 1. *Agricultural Botany*,—2. *Medical Botany*,—and 3. *Artistical Botany*, or the history of those plants which are employed, or afford materials, in the processes of the Arts and Manufactures. The *Medical* branch of the science has been often treated of, with something like system, by the Professional Writers of Europe and America. The other two divisions less frequently, and with less method, in various *Agricultural Journals*, *Cyclopædias*, and *Mercantile Dictionaries*. The attempt here made is an essay on the *Agricultural* branch,—or a systematic description of those Plants (both useful and pernicious) which more immediately interest *American Farmers*—especially those in the Middle States of this Confederacy. The *Botany of the Arts*, whenever undertaken, will afford a highly interesting theme for some future laborer in this elegant department of Natural History.

In compiling this *Farmer's Flora*, I found it somewhat difficult to determine, satisfactorily, the line of demarcation between the Plants entitled to a place in it, and those which might properly be omitted. It may, perhaps, be thought by some, that the list is unnecessarily large,—while others may be of opinion that there are species left out which ought to have been inserted. My aim has been,—not, certainly, to describe all the plants which an accomplished Agriculturist might very properly desire to know; but—to include those only (whether in the wood-lands, the fields, or the kitchen-garden,) of which no intelligent Farmer would willingly be ignorant. When he shall have made himself familiar with these, he can extend his acquaintance with the Vegetable Tribes, at pleasure, by having recourse to more general and comprehensive works; such, for example, as the *Flora of North America*, by TORREY and GRAY,—or Prof. DE CANDOLLE's *Prodromus* of a Natural System, comprising all the known forms of vegetation upon this terraqueous globe.

In my humble opinion, no Education can be deemed sufficient without some acquaintance with the rudiments, or first principles, of Botanical Science—some rational knowledge of the vast and multiform creation around us, known as the Vegetable Kingdom. I consider such knowledge just as indispensable to a rightly instructed people, as any of the usual elementary branches of school learning. By this, however, I do

not mean the smattering of a few obsolete terms, unconnected with any available ideas—which, in too many instances, passes under the imposing name of “BOTANY”: but I do mean, that thorough conception of the general nature and relations of Plants, which may be acquired by the aid of such works as the *Botanical Text-Book* of Prof. A. GRAY. In all other employments, it is very properly expected that a workman shall not only be expert in the manipulations of his art, but shall also be well acquainted with the nature of his materials: and I can perceive no good reason why it is not equally incumbent on a practical farmer to understand the true character of those plants, which it is his especial interest either to cultivate or to extirpate.

If our American youths who are being educated with a view to Agricultural pursuits, were thoroughly instructed in the admirable *Text-Book*, above referred to,—and were then required to make themselves botanically acquainted with that portion of the vegetable kingdom which annually demands their attention, on the farm,—the Profession would speedily assume a new and engaging aspect. The labors of the field would be blended with the contemplation of facts and phenomena of the deepest interest to inquiring minds,—and *Agriculture*—instead of being shunned, as an irksome drudgery—would be justly esteemed as one of the noblest employments of a free and intellectual people.

If the present Essay may in any degree tend to promote that auspicious result, the Author will derive a sincere gratification from the belief, that the time and attention devoted to its preparation have not been wholly misapplied.

WEST CHESTER, PENNA.,
June, 1847.

WEEDS.

In popular language, any homely plant which is not noticeable for the beauty of its flowers, nor entitled to respect by a reputation for medicinal or other useful qualities, is designated by the epithet *weed*. In an agricultural sense, the term is used with a more restricted meaning, and is applied to those intrusive and unwelcome individuals that will persist in growing where they are not wanted,—in short, the best definition that has yet been given of a weed is the old one, “a plant out of place.” Most of the weeds troublesome in our agriculture are immigrants, either from the Old World, or the warmer portions of this continent. The number of plants indigenous to our country, that are entitled to rank as pernicious weeds, is comparatively small. As the aborigines disappeared with the advance of the whites, so do the native plants generally yield their possession as cultivation extends, and the majority of the plants to be met with along the lanes and streets of villages, and upon farms, are naturalized strangers, who appear to be quite at home, and are with difficulty to be persuaded or driven away.

The labors of the agriculturist are a constant struggle ; on the one hand, by presenting the most favorable conditions possible, he endeavors to make certain plants grow and produce to their utmost capacity ; and on the other hand, he has to prevent the growth of certain other plants that are ready to avail themselves of these favorable conditions. The farmer is interested in two points concerning weeds : how they get into his grounds, and how to get them out. As cultivation is all the more profitably carried on if the farmer knows something of the nature and character of the plants he would raise, so, if he would successfully operate in the other direction, and stop plants from growing, he can do so all the better if he knows what are the peculiar habits of the individuals with which he has to contend,—and it is quite as important

to be familiar with the manner of growth, and the mode of propagation of a weed, as it is to be with that of an useful plant. A plant that spreads itself entirely by the seed must, of course, be differently treated from one that multiplies by the root also, whether we would propagate or destroy.

A sound constitution, established by a proper regard to the conditions of health, is not only the best preventive to the attacks of disease, but much facilitates recovery, if this be contracted ; in like manner thorough culture and good farming ensures a sort of general exemption from the pestilence of weeds, and renders easy the subjugation of those which happen to make their way into the grounds. In agriculture as in morals, idleness is the mother of vice, and if the ground be not occupied with something good, there will be a plenty of the opposite character to take its place. Possession is a great advantage in other matters than those of the law, and a plant, whether useful or troublesome, when once fully established is not disposed to yield without an argument. "That learned and sagacious observer of Nature—the late professor DE CANDOLLE—remarks, that 'all the plants of a country, all those of any given place, are in a state of war, in relation to each other. All are endowed with means, more or less efficacious, of reproduction and nutrition. Those which first establish themselves accidentally, in a given locality, have a tendency, from the mere fact that they already occupy the space, to exclude other species from it: the largest ones smother the smallest ones; the longest lived ones supersede those of shorter duration; the most fruitful gradually take possession of the space which would otherwise have been occupied by those which multiply more slowly.' The farmer, therefore, should avail himself of this principle, and aid the more valuable plants in their struggle to choke down or expel the worthless." (Ed. 1.)

Weeds are introduced upon a farm in a variety of ways. Many have their seeds sown with those of the crops; this is particularly the case where the seeds of the weeds and of the grain are so nearly alike in size that their separation is difficult. Proper care in procuring and preserving clean seed will often save much future trouble and vexation. The observing farmer will notice the means which nature has provided for the scattering of seeds, and he will find that the most pernicious weeds seem to have been especially furnished with contrivances to facilitate their dispersion. The Clot-bur, Beggar's Lice, and others, have barbs or

hooks by which they adhere to clothing and the coats of animals, and are widely distributed by this agency. All of the Thistles, and many others of the same family, have a tuft of fine silky hair attached to the seed, or more properly fruit, by which they are buoyed upon the air, and wafted from place to place. So numerous are the ways by which seeds are dispersed, that, however careful a farmer may be upon his own premises, a slovenly and neglectful neighbor may cause him infinite annoyance by furnishing his lands with an abundant supply. In some European countries a farmer may sue his neighbor for neglecting to destroy the weeds upon his lands, or may employ people to do it at the delinquent's expense.

The vitality of seeds, particularly if buried in the earth below the reach of the influences which cause germination, in some cases endures through many years; hence, an old field, after deep plowing, has often a fine crop of weeds from the seeds thus brought to the surface. Weeds that have been cut or pulled after they have flowered, should not be thrown into the barnyard or hog-stye, unless the farmer wishes to have the work to do over again with their progeny, as the seeds will be thoroughly distributed in the manuring of the land. In England they dry the pernicious weeds and burn them, not only destroying root and branch, but seed also. In all weeding, it is of the greatest importance that it should be done before the plants have formed seed. This should be regarded equally with annual and perennial weeds. The prolific character of some weeds is astonishing; each head of an Ox-eye Daisy or White-weed is not a simple flower, but a collection of a great many flowers, each of which produces a seed; and, as a single plant bears a great many heads, the number of seeds that a single individual is capable of supplying in a season amounts to several hundreds. In weeds, evil should be, emphatically, nipped in the *bud*. In this respect, the farmer should act in the spirit of the Western savages who kill the women and children of their enemies, as a tolerably sure way of preventing the multiplication of warriors. Annual weeds are much more readily kept in subjection than the perennial ones, which, especially those which multiply extensively by their underground stems or roots, often become truly formidable. Here not only has the propagation by seeds to be prevented, but a subterranean and hidden enemy has to be combatted. It is very important that the agriculturist should understand the way in which these

plants grow, that he may know how to direct his efforts to subdue them. A perennial weed, like the Canada Thistle or Couch Grass, is, during the early stage of its existence, easily destroyed ; but later in the season it makes strong underground stems, or roots, as they are commonly but incorrectly called, which have great tenacity of life, and which have within them an accumulation of nourishment which enables them to throw up several successive crops of herbage ; plowing such weeds generally aggravates the trouble, for, unless every fragment be removed from the ground, a thing very difficult to accomplish, each piece that is left makes a separate plant. In the case of weeds of this description, the necessity of early eradicating them is apparent, for if once well established, and an underground provision depot formed, the farmer and the plant are placed in the condition of beseiging and beseiged forces—as long as the provisions hold out the latter can maintain its ground. It becomes a question of endurance, for the underground supply must be eventually exhausted in the attempt to produce new stems and leaves, and if the farmer, by persistently cutting these away, prevents any new accession to the stock of provision, the enemy must at length succumb. Often repeated cuttings will at length exhaust the underground portion of its vitality. In some cases salt has been used with success, especially upon Thistles, applied immediately after mowing. The farmer will do well to keep in mind two rules. *Do not let weeds flower, and do not let them breathe*, for the leaves may be considered the lungs of the plant, and without the aid of these it cannot long maintain itself.

THE STRUCTURE OF PLANTS.

THIS chapter has been prepared for the purpose of giving those who use this work, some general notions upon the structure of plants. From the limited space allowed, the principal facts can only be stated, and those very briefly. Those who desire to be more fully informed upon this subject, are referred to the admirable works of Prof. GRAY. His progressive series, "How Plants Grow," "Lessons in Botany," and "Botanical Text-Book,"—the first for children, the second a comprehensive popular work, and the last an extended treatise,—are all that can be desired in the way of popular and at the same time thoroughly scientific elementary works.

1. The material world is divided into *Unorganized* (or *Inorganic*) substances, and *Organized* (or *Organic*) beings. The mineral substances of the earth and air and water belong to the first, and plants and animals to the second of these divisions. Unorganized substances have neither life nor growth, and are without parts or *organs* adapted to special offices. Organized beings have life and growth; they start from a simple germ, and go through progressive stages of developement; they are furnished with parts or *organs* which have particular functions to perform, either in promoting the growth of the individual or in perpetuating its kind.

2. Organized beings are of two kinds, *Vegetables* and *Animals*. A vegetable or plant may be defined as a being which converts the unorganized matter (contained in the air, water and the earth) into organized material which is either directly or indirectly the food of animals. Animals have not the power of appropriating unorganized substances, but live upon the food furnished by plants, for the reception of which, they are provided with an internal cavity or stomach. Plants are producers of food, while animals are consumers of food.

3. The study of plants in all that relates to their growth and reproduction, their resemblance to and difference from one another in the structure and arrangement of their parts, their distribution over the earth's surface, and whatever relates to the history of a plant, constitutes the science of Botany. The science is divided into several departments; that which treats of the nature and functions of the different parts or organs is Structural Botany—that branch of the science of which we wish to give a brief outline in the following pages.

4. All plants fall into two great series: 1st, those which have manifest flowers and are reproduced by seeds, — *Flowering* or *Phanerogamous* plants; 2d, those which have no flowers and no proper seeds, but are

not produced by minute dust-like grains called *spores*,—*Flowerless* or *cryptogamous* plants. As cryptogamous plants do not often appear as seeds and as their study is rather difficult, they are left out of consideration in the present work.

5. Flowering plants have two kinds of organs; those parts which are concerned in sustaining the life and growth of the plant,—*Organs of Vegetation*; and those which provide for its perpetuation by means of seed,—*Organs of Reproduction*.

6. The organs of vegetation are three, viz.: *ROOT, STEM, and LEAF*. These the plant has at a very early stage of its existence. If a young seedling plant, as a Radish, Bean or Pumpkin be taken from the ground as soon as it has "come up," it will be found to consist of a short stem with a pair of leaves at the top and a root at the bottom of it. By soaking the seeds until the seed-coat is softened, and then carefully breaking it open, the young plant will be found within, though in a much less developed state. The seed always contains within it the young plant, more or less developed, either lying straight in the seed or variously coiled or folded up; this is called the *Embryo*. By the influence of the warmth and moisture of the earth, the embryo bursts the skin of the seed and begins to grow. The sprouting of the embryo is called *germination*. The parts of the embryo are; 1st, the little stem, called the *Radicle*; and 2d, the leaves which in the Radish, Bean, &c., first appear above ground and are usually called *Seed-leaves*, these are the *Cotyledons*; between them there is a little bud (which is not always to be seen in the embryo, but appears soon after it begins to grow), the *Plumule*. In germination the radicle elongates, the lower end—whatever the position the seed may be placed in—pushes itself downward into the earth, and its upper end bearing the seed-leaves is raised to the light and air. That portion of the radicle which goes downward forms the *Root* or *Descending Axis*, that which rises above the surface of the earth is the *Stem* or *Ascending Axis*.

In the instances quoted as illustrations (Radish, Bean and Pumpkin), the embryo is large and fills the whole seed; the seed-leaves, in the Bean especially, are thickened and rounded from being filled with a supply of food which nourishes the young plant until it can form roots and draw sustenance from the soil. In many seeds, as the Pea, Acorn, &c., the cotyledons are very much distended and do not rise to the surface, but only open far enough to allow the radicle to protrude.

7. In many seeds the embryo, instead of containing the food for its early growth within its cotyledons, has a more or less abundant supply surrounding it, called *Albumen*. The embryo is placed sometimes in the centre of the albumen—or at one side, or sometimes coiled in a more or less complete ring around it. Seeds which contain albumen are said to be *albuminous*, those having none, *exalbuminous*. The albumen may be large in proportion to the embryo, or very sparing; its texture varies, being *farinaceous* or mealy (as in Buckwheat), *horny* or *corneous* (like that of Coffee), *oily* (as in the Poppy), or *mucilaginous*.

8. In the examples given, the embryo has in each case two cotyledons;

plants having embryos of this kind are termed *Dicotyledonous* (i. e. having two cotyledons or seed-leaves). There are many plants in which the embryo has but one cotyledon; this is the case with Wheat, Indian Corn, the Onion, Lily, &c.; such plants are *Monocotyledonous* (i. e. having one cotyledon). This is an important distinction, and divides all our flowering plants into two great classes—Dicotyledonous and Monocotyledonous plants—which are further distinguished by important differences in their stem, leaves, and flowers. In the Pine Family, the embryo has several cotyledons in a whorl — *Polycotyledonous*, (Fig. 238).

9. The Root or Descending Axis, is that portion of the radicle which grows downwards, fixing the plant to the soil; its office is to absorb nourishment from the earth, and to this end it is provided with an extended surface by being generally subdivided into branches and supplied with multitudes of delicate fibres or root-hairs. The root of a plant, which springs from the seed, makes its growth and produces flowers and seed all in one year, is called *annual*. When the plant requires two years to complete its career, it is *biennial*; and when it lives through a number of years, it is *perennial*.

10. The various forms which roots present, are produced either by the branching of the principal root, or by the enlargement of it and that of its branches. Where the main root continues distinct and unbranching, or sends off only occasional branches, a *tap-root* is formed; ordinarily, however, the main root is lost in its numerous branches, or many roots start from the lower end of the radicle, and we have a cluster of roots. Annual roots are very much divided into numerous thread-like branches; such are termed *fibrous roots*. In biennial plants, the first year is occupied in storing up nourishment to be expended in producing flowers and seed in the following year; this is frequently deposited in the root, hence the roots of biennials are usually thick and fleshy. If such roots taper regularly downwards (as in the Parsnip and Carrot), they are *conical*. If they taper both upwards and downwards (the Long Radish, for example), we have a *spindle-shaped* or *fusiform* root. When much enlarged laterally, so as to be broader than long, the root is *turnip-shaped* or *napiform*. In these forms the branches are small and hair-like. In some perennial roots, those where the stem dies down annually, there is often an accumulation of nourishment and the roots become *tuberous*, as in the Sweet Potato.

11. Under favorable circumstances, roots may spring from any portion of the stem and branches. When a branch lies along the earth, or when a cutting is placed in the soil, roots are given out; these are termed *secondary roots*. Some stems throw out roots even at a great distance from the earth (*aërial roots*), which serve in some cases only as supports to the stems of climbing plants, adhering to rocks, the trunks of trees and other objects, as in the Ivy and Poison Oak,—or they at length reach the earth and help sustain the plant, as in the Indian Corn, which often throws out roots from the lower part of the stem, at some distance from the surface of the earth. In *Parasites* (those plants which

feed upon the juices of other plants), the roots adhere to or penetrate the plants upon which they feed, either above-ground, as the Mistletoe and Dodder, or they attach themselves to their roots beneath the surface, as in the various *root-parasites*. Roots branch without any regular order, and very seldom produce buds, in which they differ from the

12. **STEM OR ASCENDING AXIS.** As the elongation of the radicle lifts the cotyledons of the bean, &c., above the surface of the earth, so in turn the plumule or little bud is lifted up; its leaves, or leaf, as the case may be, expand, another bud is produced, and thus the process goes on, and the plant increases in length by the developement of a succession of leaves separated by a greater or less length of stem. The point on the stem from which a leaf, or leaves, arise is termed a *Node* (or knot) and the spaces between the nodes are *Internodes* (or joints). A stem is made up of leaf-bearing internodes and terminated by a bud, which is a collection of very short internodes with their undeveloped leaves. The nature of the bud is seen in a marked manner in some trees in which the whole of the next season's growth may be seen in miniature, just as the first internode of the plant is found in the seed.

13. A stem which continues to develop from the apex only, remains *simple*; but commonly the stem branches. Branches proceed from buds which with few exceptions, appear on the stem in the angle formed by its union with the leaf (the *axil*). The position of the branches is determined by that of the leaves, and did all the buds develop, the form of the plant would be regular. Sometimes buds appear out of their usual place, (the axils of the leaves) and as roots may develop from any part of the stem, so under some circumstances may buds. Such buds are termed *adventitious*; they may even appear on the root, which does not ordinarily produce buds. Where more than one bud appears in an axil, the additional ones are called *accessory*; and where, as is sometimes the case, buds appear above the axil, they are *extra-axillary*. When the stem continues to elongate by the terminal bud and the main trunk is kept distinct, as in the Fir Trees, the stem is *excurrent*; but it is usually lost in the branches, when it is *deliquescent*.

14. If a stem of a plant dies down at the end of the season, it is an *Herb*. Herbs, according to the duration of their roots, may be annual, biennial or perennial (9); where the stem becomes woody it is, according to its size, a *Shrub* or *Tree*. *Under-shrubs* are woody plants with stems rising but little above the surface of the ground. If the stem is only woody near the base it is *suffruticose*; or when but little woody, *suffrutescent*. *Shrubs* and *Trees* differ only in size; those under 15 or 20 feet high and branching from near the ground are called shrubs. The jointed stem of grasses is called a *Culm*.

15. The various modifications of the stem and branches have received distinguishing names, of which the most used are given here. When the stem is too weak to stand erect but bends over, it is *declined*; if it partly lies on the ground, it is *decumbent*; or if it lies entirely upon the ground, *prostrate* or *procumbent*. If it clings to objects by means of tendrils (16), like the Grape vine, or by aerial roots (11), like the Ivy, it is

climbing or *scandent*. If it winds around other objects like the Bean and Hop, it is *voluble* or *twining*.

16. Branches which arise from the main stem, below the surface of the earth, are called *suckers*.

If a branch bends over so as to reach the ground and there takes root, a *stolon* is formed, which sends up branches of its own, and by the division or the dying away of the connecting portion, becomes an independent plant. Plants multiplying in this way are *stoloniferous*. A long slender thread-like branch which strikes root at its extremity, as in the strawberry, is called a *runner*.

Spines or *thorns* are hardened sharp-pointed branches; they may frequently be found bearing leaves, especially in their young state, which shows their true character. Sometimes the thorns are branched, as those of the Honey Locust.

A *tendril* is a weak, leafless branch, capable of coiling around objects to support climbing plants (Fig. 95). Some tendrils, however, belong to the leaf (26).

17. Besides the aërial form of the stem and branches, there are several subterranean ones which are often mistaken for roots, but are to be distinguished from them by having nodes, producing regular buds, and often having rudiments of leaves (11). The *Root-stock* or *Rhizoma* is an under-ground stem, advancing by its terminal bud and throwing off roots from each node or from the whole surface; the Couch- or Quitch-grass furnishes a good illustration of one form of rhizoma; it often becomes fleshy, as in the Sweet Flag and Bloodroot.

18. Where an underground stem thickens at the apex, a *Tuber* is formed, as is the case in the Jerusalem Artichoke and Potato. Though popularly considered as a root, the potato is a short thick under-ground stem, having scars which are the rudiments or representatives of leaves, and the "eyes" are buds in their axils. A *Corm* or solid bulb is a more or less globular subterranean stem, as that of the Indian Turnip. A *bulb* is a very much shortened stem, covered with scales, which are the thickened bases of former leaves. The White Lily has the scales separate, and affords an example of the *Scaly bulb*, while in the Onion the scales surround one another and form a *Tunicated* or *Coated bulb*. The stem is here often reduced to a mere plate, from the lower surface of which proceed the roots, and from the upper the scales. *Bulbets* are small bulbs produced above ground: the Spotted Lily of the gardens bears these in the axils of the leaves, and in the Wild Leek, or Garlic, they appear in the place of flowers.

19. The internal structure of the stem presents two marked varieties. In dicotyledonous plants, the woody portion occupies a ring between the pith and bark, and in stems of this kind which last from year to year, they increase by an annual deposition of wood outside of that of the previous year; such plants are termed *Exogenous* or *Erogenous*, (meaning outside growers). The stem of a monocotyledonous plant presents no such distinction into pith, wood and bark, but the wood is in threads or fibres, distributed irregularly throughout the pith, as is seen in cutting

across a stalk of Indian Corn; these stems are called *Endogenous* or *Endogens*, (inside growers). The terms Dicotyledonous and Exogenous are used synonymously, as are Monocotyledonous and Endogenous.

20. THE LEAF. It is in the leaf that the important work of transforming the crude sap, which is taken up by the roots, into organized material fit to enter into the growth of the plant, is performed. In this process the agency of sunlight is required and a free exposure to the air, hence the leaves are so made and so disposed upon the stem as to present the greatest possible surface to these influences. A leaf, having all its parts, consists of an expanded portion, (the *Blade*, *Lamina*, or *Limb*,) a stalk by which it is attached to the stem, (the *Petiole* or *Leaf-stalk*,) and a pair of appendages at the base of the leaf-stalk, called *Stipules*. The petiole and stipules may one or both be absent, the essential portion being the blade. Leaves having a petiole are said to be *petioled* or *petiolate*; without a petiole they are *sessile*. Where the blade joins the petiole, or, if this be absent, the stem, is its *base*; the opposite ends are the *apex*, and the sides are the *margins*.

21. The blade of the leaf consists of a green pulpy substance through which runs a framework of fibres to give it strength; these, as they are large or small, are called *Ribs* or *Veins*, and the mode in which they are distributed is termed *venation*. There are two principal kinds of venation: 1st, where the veins run mostly parallel, and do not branch nor form a network; these are *parallel-veined* (sometimes called *nerved*) leaves, and are mostly to be found in endogenous plants (19); 2d, where the veins form a sort of network through the pulpy portion; the leaf is then said to be *netted-* or *reticulately-veined*. This kind of veining has two forms: 1st, where a strong rib, (the *midrib*), runs from the base to the apex of the leaf, from which lateral veins branch off, like the plume upon a feather; this is called *feather-veined*, or *penni-nerved* (Fig. 66); 2d, where several strong ribs start from the base and spread like rays from the centre; here we have a *radiately-veined leaf* (Fig. 68); these, from their resemblance to a web-foot, are also called *palmately-veined*.

22. Feather-veined leaves are usually longer than broad, while in the radiately-veined the form approaches the circular. The general outline of leaves, as well as that of other flat portions of plants, is described by a variety of terms. A very narrow leaf with two parallel margins is *linear*, as the leaves of most grasses (Fig. 260); when the blade tapers upwards or to each end, and is several times longer than broad, it is *lanceolate* (Fig. 179); when broader in proportion, *oblong*; if both ends are rounded and of equal width, *elliptical*; when having the form of a hen's egg cut lengthwise, with the broad end down, it is *ovate*; when nearly round, *orbicular* (Fig. 44). If the leaf tapers towards the base instead of towards the apex, it is *oblanceolate* and *obovate*, the reverse of lanceolate and ovate. If rounded above and long and narrow below, it is *spatulate*, and *cuneate* when shaped like a wedge.

23. When the two sides of the base are prolonged and rounded, the leaf is said to be *cordate* or *heart-shaped* (Fig. 171); if such a leaf be much broader than long, it is *kidney-shaped* or *reniform*. If the pro-

longed portions or lobes, instead of being round, are sharp and pointing downwards, the leaf is *arrow-shaped* or *sagittate* (Fig. 182 and 243) ; or if the lobes, instead of pointing downwards, are turned outwards, it is *halbert-shaped* or *hastate* (Fig. 181) : if the lobes are rounded, it is *auriculate* or *eared*. When the lobes of a kidney-shaped leaf unite, and the petiole appears to be fixed in its centre, it is called *peltate* or *shield-shaped*.

24. Various terms are used to describe the *apex* or termination of leaves and similar bodies, viz. : *acute*, when terminating in a sharp angle without much tapering ; *acuminate* or *pointed*, if the apex is narrowed into a point ; *mucronate*, if furnished with a small abrupt point ; *obtuse*, if ending in a rounded blunt point ; *truncate*, when it appears as if cut off abruptly ; *retuse*, if slightly indented at the apex ; *notched* or *emarginate*, when decidedly indented ; and *obcordate*, when so much so as to be reverse heart-shaped.

25. The margin of the leaf, when without any notches or indentations of any kind, is *entire* ; when with sharp teeth pointing forwards, like the teeth of a saw, it is *serrate*. If the teeth point outwards instead of towards the apex, it is said to be *dentate* or *toothed* ; if the teeth are rounded, it is *crenate* or *scalloped*. If these indentations of the margin are small in degree, then the diminutives, *serrulate*, *denticulate* and *crenulate*, are employed.

A margin with a wavy outline is called *repand*, or if the indentations are deeper, shallow and rounded, *sinuate*. When the teeth are irregular and sharp, the leaf is said to be *incised* or *cut*. A *lobed* leaf has the margin deeply cut with a definite number of divisions ; if the divisions reach nearly to the middle, it is *cleft* ; if nearly to the midrib, *parted* ; or if quite to the midrib or base, *divided*. The number of these divisions is expressed by numerals ; thus we say 2-lobed, 3-cleft, 4-parted, &c. The division of the margin follows the distribution of the veins, and a pinnately-veined leaf will be *pinnately-cleft*, *pinnately-parted*, &c., and a palmately-veined one will be *palmately-lobed*, *palmately-divided*, &c.

26. Leaves, as to the division of their margins, present every variety from entire to so deeply cut that the division reaches the midrib. The parts of a divided or parted leaf are called *Segments* or *Lobes*. However much it may be divided, the leaf is considered as simple unless the parts are *jointed* together, or *articulated*, in which case it becomes compound. The parts of a compound leaf are called *Leaflets*, and the same terms are used for them that are employed in describing leaves. Compound leaves, like divided ones, present two principal forms : when a pinnately-veined leaf becomes compound, it forms a *pinnate* leaf (Fig. 78), the leaflets being arranged on the midrib which becomes the *Common Petiole* or *Rachis* ; so a palmately or radiately-veined leaf becomes *palmately compound* or *digitate*, bearing the leaflets at the top of a common petiole (Fig. 64). When the leaflets of a pinnate leaf are in even pairs, the leaf is *equally-* or *abruptly-pinnate* ; *odd-pinnate*, if the common petiole terminates with a leaflet (Fig. 53). Sometimes the common petiole is prolonged into a *Tendril* (Fig. 71), and the leaf aids in supporting the

plant. When the leaflets themselves have a stalk (*Petiolule*) they are *petiolulate*. Often the leaflets of a pinnate leaf themselves become compound, when we have a *doubly* or *twice-pinnate* leaf; this division may be continued to produce *thrice-pinnate*, &c.

The number of leaflets in a compound leaf is expressed by *pinnately 3-foliolate*, *5-foliolate*, &c., or *palmately 3-foliolate*, *5-foliolate*, &c.

Very much divided leaves, especially if irregularly so, are called *decompound*.

27. The point of attachment of the leaf to the stem is its *insertion*. Those leaves which are inserted at or beneath the surface of the ground, are called *Radical-* or *Root-leaves*; those along the ascending stem, *cauline*; and those near the flower, *Floral-leaves* or *Bracts*.

The insertion of the leaf is in three principal ways: when two arise from each node or joint, they are *opposite* (Fig. 34); when there are 3 or more at each joint, they are *whorled* or *verticillate* (Fig. 114); and *alternate*, when only one is produced at each node (Fig. 24). Alternate leaves present a great variety in their arrangement. When one is produced above another on exactly opposite sides of the stem, they are *2-ranked*. When they are so placed that each is $\frac{1}{3}$ the circumference of the stem from the other, we have the *3-ranked* order, and so on for the *5-ranked* and others. The subject of the arrangement of leaves, or *Phyllotaxy*, as it is called, is one which presents much interest to the curious, and will be found clearly explained in Gray's Botanical Text Book.

28. When the bases of two opposite leaves grow together, appearing as if the stem passed through them, they are *connate-perfoliate*; when a single leaf presents this appearance by the union of the lobes of its base beyond the stem, it is called *perfoliate*.

Pairs of opposite leaves crossing each other at right-angles are *decussate*.

Where several leaves are crowded together, so as to spring apparently from the same point, they are *clustered* or *fascicled*.

Leaves and other parts which fall soon after expanding, are *fugacious* or *caducous*; *deciduous*, when they fall at the close of the season; *persistent*, when they last the whole year or longer.

29. The manner in which leaves are disposed in the bud is their *vernation* or *prefoliation*. When each leaf is infolded lengthwise, it is *conduplicate*; *plicate*, when several times folded or plaited; *involute*, when the margins are rolled in; *revolute*, when rolled backwards towards the midrib; *convolute*, when rolled up from one edge; and *circinate*, when spirally rolled from the apex downwards.

30. Stipules (20) are not always present. In the Magnolia Family their office seems to be to protect the bud, and they fall away early; in other cases they remain with the leaves. When the leaflets of a compound leaf have stipular appendages, they are said to be *stipellate*. If the stipules adhere by one edge to the petiole, they are *adnate*, as in the Clover (Fig. 74), and if they unite around the stem, they form a sheath or *Ochrea*, as is seen in Polygonums (Fig. 179).

31. ORGANS OF REPRODUCTION consist of the flower, fruit and seed.

Flowers are developed from buds occupying the same position as those which produce branches, and the botanist regards the flower as a short branch with its leaves in a peculiar state of development, the different parts of the flower answering to leaves. The manner in which flowers are arranged upon the stem is termed *inflorescence*.

32. The simplest form is when the stem is terminated by a flower-bud, as in the Tulip; as the stem grows no longer in this direction, this is called *determinate* inflorescence, but it is generally the case that flowers are thrown out from the axils of the leaves, while the stem keeps on growing. This form, of which there are several modifications, is *indeterminate*. If the flowers arise from the axils of the leaves of the stem which remain like those of the rest of the plant, the inflorescence is *axillary* (Fig. 184); but more commonly, when flowers are produced, the leaves become smaller, and the joints of the stem shorter, and some kind of a flower cluster is formed. In this case the reduced or transformed leaves are called *Bracts*, and the flower cluster receives various names according to the form it assumes.

33. When flowers arise each from the axil of a bract upon a short pedicel of its own, a *Raceme* is formed; the main stem or axis is its *Rachis* or *Common Peduncle*; and the stalk of each flower, its *Pedicel*. Here the lower flowers open first. If the flowers are sessile instead of being raised upon pedicels, a *Spike* is produced. If the lower pedicels of a short raceme are elongated so that all the flowers are raised up to the same level, it forms a *Corymb*; and if the internodes of the common peduncle are at the same time shortened so that the pedicels all apparently start from the same point, an *Umbel* (Fig. 108,) is the result, the pedicels of which are called *Rays*, and the collected bracts at their base form an *Involucre*. It is usually the case that the umbel becomes compound and the rays themselves bear small umbels or *Umbellets*; if these have any involucre they are called *Involucels*. A *Head* is where the flowers are closely crowded together as in the Clover (Fig. 74). In the Composite Family, of which the common Sunflower is an example, the apex of the stem is expanded to form a *Receptacle*, upon which the separate flowers or *Florets* are placed; here the bracts form an involucre around the head and sometimes appear upon the receptacle as *Chaff*. A fleshy spike like that of the Indian Turnip and Skunk Cabbage is called a *Spadix*, and the hood-like involucre which sometimes surrounds it, a *Spathe*. A scaly spike, like those of the willow, is called an *Ament* or *Catkin*.

If the pedicels of a raceme are branched a *Panicle* is produced.

In the determinate form of inflorescence, the flowering is often continued by the production of flowering branches from the axils of the leaves or bracts below the terminal flower; these branches may throw out others, and thus a *Cyme* is produced. In this case the central or uppermost flower is oldest and it is thus distinguished from forms of indeterminate inflorescence. A flower-stalk which arises from below or near the surface of the ground is called a *Scape*.

34. THE FLOWER has two kinds of organs; the flower-leaves or *Floral*

Envelopes, which are usually in two series; the outer of usually green leaves, the *Calyx* or *Flower-cup*; and an inner and more delicate portion, the *Corolla*; and the *Essential Organs*, the parts necessary to the production of seed, the *Stamens* and *Pistils*, which are also in two series. The portion of the stem to which these are attached is the *Receptacle*. These parts are arranged on the receptacle in a regular ascending order: first, the calyx; then the corolla; within and above this, the stamens; and in the centre of the flower, the pistils. (Fig. 4.)

35. The calyx is generally green and leaf-like; the pieces of which it is composed are called *Sepals*.

The corolla is of a more delicate texture than the calyx and of some other color than green; its parts are called *Petals*. The broad expanded portion of the petal answering to the blade of the leaf, is its *Limb*, and the narrowed base, corresponding to the petiole, is, when present, its *Claw*.

36. The stamens which are to be found next within the petals have also two parts; a rounded or lobed body or case called the *Anther*; and the usually slender stalk which supports it, the *Filament*. Although the stamen is so unlike a leaf, the botanist regards it as representing in its anther, the blade of a leaf with its margins infolded to form a hollow bag, and in its filament, the leaf-stalk. This would perhaps be difficult to comprehend if there were not some plants which show a regular gradation from green calyx leaves to perfect anthers. In half double roses we can often see bodies that are half petals and half anthers, showing that they are but modifications of the same fundamental organ. As the blade is the essential part of the leaf so is the anther that of the stamen, and the filament may be wanting, when the anther is sessile. The anther produces a powder, usually of a yellow color, which is discharged ordinarily by slits in its walls or sometimes by pores at the apex (Fig. 144) or by valves or trap doors (Fig. 16). The office of this powder, called *Pollen*, is to fertilize the ovary. Anthers are usually 2-celled, sometimes 4-celled, or one-celled by the confluence or running together of the cells. or by the abortion or disappearance of one of them.

If the anther rests directly upon the apex of the filament it is *innate*; if the whole length of one face is applied to the filament, it is *adnate*; when it looks towards the centre of the flower, it is *introrse*; when looking outwards, *extrorse*; it is called *versatile* when hung to the apex of the filament in such a way as to swing loosely in any direction.

When the filament is prolonged between the anther-cells it is termed the *Connective*.

The number of stamens is expressed by *monandrous*, *diandrous*, *triandrous*, &c., for a flower with 1-2 and 3 stamens, &c.; *polyandrous* for many stamens: words obtained by putting the names of the classes of Linnæus, *monandria*, *diandria*, &c., founded on the number of stamens, into the adjective form.

37. THE PISTIL or pistils occupy the centre of the flower; they are the parts which produce seeds. The pistil has three parts; the hollow portion below, the *ovary*; a more or less prolonged stalk above this, the *style*, which has a variously shaped termination, the *stigma*. The ovary

and stigma being the essential portions, the style may be, and frequently is, wanting, when the stigma is sessile. The ovary contains within it the rudiments of seeds or *Ovules*, which are, after they have received the fertilizing influence of the pollen which is communicated through the stigma, developed into seeds. The number of pistils in a flower is expressed by prefixing the greek numerals to *gynous*; a *monogynous* one having one pistil; a *digynous* one having two pistils, &c. For farther in relation to the structure of the pistil, see 45.

38. The stamens and pistils being the essential parts of the flower, one or both series of the floral envelopes may be wanting: when one of the series is absent, it is the corolla, and the flower is then *apetalous* (without petals); or when both are absent, the flower is *naked*.

A *complete* flower has all four series of organs present: if either of these is lacking it is then *incomplete*. An incomplete flower may produce seeds, having both stamens and pistils, and as long as these are both present, the flower is *perfect*. If either of these is absent, the flower is *imperfect*. These organs are frequently produced in separate flowers (Figs. 69 and 70): when the *staminate* and *pistillate* flowers are both borne on the same plant, they are said to be *monacious* (i. e. in one household); or if produced on different plants, *diacious* (in two households). When some of the flowers are perfect and the others separated, they are *polygamous*. Flowers having the different series of organs with the same number of parts in each, are *symmetrical*; those having the parts in each series of the same shape, are *regular*; or of different shapes, *irregular* (Fig. 13).

39. The infinite variety of forms which flowers present is produced by modifications in these four series of parts. Some parts of a set may be wanting or much changed from the usual form, or the number of parts may be multiplied. The different parts of a set may unite and form one piece, or the structure may be still further varied by the cohering or growing together of the parts of two or more adjoining series.

It is very common to find the sepals of a calyx or the petals of a corolla more or less joined by their contiguous edges so as to form a tube. When the sepals are distinct, the calyx is *polysepalous*; and where united, *monosepalous*. Where the union is only partial and the upper portions of the sepals free, it is sometimes convenient to say that it is cleft or parted as the case may be.

If the corolla has distinct petals, it is *polypetalous*; when these are more or less joined, *monopetalous* or *gamopetalous*. In a monopetalous corolla the parts are not usually united for their whole length:—the free or expanded portion is the *Limb* and the narrower portion the *Tube*. Among the forms of monopetalous corollas may be mentioned the following: the *funnel-shaped* or *infundibuliform*, when the tube is narrower below but spreads at summit (Fig. 167); the *bell-shaped* or *campanulate*, with a rounded base and open or spreading border; *tubular*, when elongated and more or less cylindrical throughout (Fig. 115); *salver-shaped*, when the tube is very narrow and bears a broad spreading limb; and *wheel-shaped* or *rotate*, with a broad limb and scarcely any

tube (Fig. 161). When the petals are irregularly united, a 2-lipped or *labiate* corolla is produced (Fig. 152).

40. The stamens and pistils are also frequently united. When stamens unite by their filaments so as to form a tube, they are *monadelphous*, (i. e. forming one brotherhood,) as in the Mallow Family (Fig. 45); or when, as in the Pulse Family (Fig. 73), they are in two sets, they are *diadelphous*, (i. e. in two brotherhoods). The union into three or many parcels is expressed by the terms *triadelphous* and *polyadelphous*. In the large Composite Family, the union takes place by the anthers, when they are *syngenesious*.

41. The pistils are oftener united than otherwise, so that what appears to be a simple pistil is frequently made up of several united ones. The union may take place by the ovaries only, the styles remaining wholly or partly free, or it may be so complete that the real nature of the pistil can only be discovered by cutting it across, through the united ovaries, which will generally present as many cells or cavities as there are simple pistils that go to make up the compound one.

42. The union or consolidation of the parts of different series frequently occurs, and this often renders the structure of the flower at first sight rather obscure. When the calyx, corolla and stamens are all free from each other and are evidently inserted below the pistils, they are *hypogynous* (i. e. under the pistil), as in Fig. 4. When calyx, corolla and stamens cohere together, but are still free from the pistil, so that the latter two appear to be inserted on the former, they are *perigynous*, (i. e., around the pistil,) as in the Peach and Cherry (Fig. 80). The union often involves the ovary; in this case, the stamens and corolla appear to be on the calyx, it is still *perigynous*; but the union is sometimes so complete that the parts appear to be inserted directly upon the ovary, when they are said to be *epigynous*; (i. e., upon the ovary). These terms are not so much used as formerly, as the condition of the parts is better expressed by saying, calyx half adherent or entirely adherent to the ovary, as the case may be.

43. The symmetry of the flower (Fig. 38) is broken up either by the suppression or nondevelopment of some parts of a set or by the multiplication of the parts: but as one or more series usually retains the normal number, there is generally but little difficulty in making out the numerical plan upon which the flower is constructed. The number of parts in a whole flower or in a set is expressed by the following terms: *binary*, if in twos; *ternary*, in threes; *quarternary*, in fours; *quinary*, in fives. *Tetramerous*, *pentamerous*, &c., (written 4-merous, 5-merous, &c.) are used to describe flowers with their parts in fours, fives, &c.

44. Ordinarily the parts of a symmetrical flower *alternate*; that is, the petals are placed over the interval between the sepals, the stamens over the interval between the petals and consequently opposite the sepals, and so on. This is to be considered the usual position, unless otherwise stated, in the description of the plant. Exceptions, however, occur, as in the Buckthorn and Barberry, where the stamens are placed directly in front of the petals.

The terms *upper* and *lower*, as applied to the parts of the flower, refer to their position in relation to the main stem or axis. The petal or sepal of an axillary flower, which lies next to the bract or farthest outward from the stem, is *lower* or *anterior*; the one on the opposite side and nearest the stem is *upper* or *superior*; and those placed right and left of these are *lateral*.

45. THE PISTIL in its simplest form, a single pistil, is regarded as a leaf with its margins folded together so as to form a closed bag or hollow portion, the ovary; its prolonged apex is the style, and the upper end of this or some portion of its margin, the stigma. A simple pistil, composed of a single leaf, whether separate or forming a part of a compound pistil, is called a *Carpel*; that portion where the margins of the leaves join, is the *Ventral Suture*; and the portion opposite to this corresponding to the midrib of the leaf, the *Dorsal Suture*. The *Ovules* (37) are placed at the ventral suture where the margins of the carpellary leaf are infolded and project more or less into the cavity, forming what is called the *Placenta*, to which the ovules are attached.

46. When two or more carpels unite, a *Compound Pistil* is formed; this will have as many cells or cavities as there are simple pistils or carpels combined; the placenta will be in the centre and the partitions or *Dissepiments* which separate the cells, being formed by the union of the contiguous sides of two carpels, will be double in their nature, although this may not be manifest (Fig. 33 represents a compound pistil of 3 carpels, cut across). Sometimes a compound pistil is but one-celled; either from the early disappearance of the partitions, when the placenta will be left free in the centre of the ovary; or the ovary may be formed by the union of the contiguous edges of several carpellary leaves, without their folding together,—the placenta in this case consist of the margins of two different leaves and may not project into the cavity of the ovary—such placenta are *parietal*, (i. e., on the walls). The number of carpels of which a compound ovary is composed, is frequently indicated by the number of styles or stigmas. An ovary of two carpels is *dicarpellary*; one of three, *tricarpellary*, &c.

47. The ovules are the little rudimentary bodies which are to become seeds: our limits do not permit us to describe their structure or to say much about them. After they have received the fertilizing influence of the pollen, communicated through the stigma, an embryo is developed within them as they mature, and a seed is formed. Each ovule is placed on a little stalk, the *Funiculus*. When the ovule is straight it is called *orthotropous*; when curved or bent upon itself, *campyotropous*; and if entirely inverted on its stalk so that its apex points to the placenta, *anatropous*.

48. Not only does the ovule enlarge and undergo a great change, in forming the seed, but the ovary also enlarges and is variously transformed and becomes the fruit. The *Fruit* is the ripened ovary, (called *Pericarp* or *Seed-vesse*), its contents and sometimes the adhering adjacent parts, as the calyx. In the Checkerberry (Fig. 147) and in the Quince, it is the enlarged and fleshy calyx which is the eatable portion of the

fruit, while in the Strawberry, it is the large and pulpy receptacle which is eaten.

49. In the process of maturing, the walls of the ovary assume a variety of texture. If they become soft and pulpy a *Berry* is formed, or if the outer portion only becomes juicy and soft while the inner part becomes hard and bony, a *stone-fruit* or *Drupe* is produced (Fig. 81). When the walls become thick or papery, we have some form of a *Pod*, or if bony, a *Nut*. The internal structure of the fruit is often different from that of the ovary; a several-celled ovary frequently producing a one-celled fruit, the other cells, and often all the ovules but one, being obliterated. It sometimes happens that more cells are present in the fruit than were contained in the ovary; this results from the formation of false partitions.

50. A pod formed of a single carpel, opening at maturity by its inner or ventral suture, is a *Follicle* (Fig. 7); if it open at both sutures and splits into two valves or pieces, it is called a *Legume*, of which the Pea and Bean are familiar examples. A pod formed by a compound ovary is termed a *Capsule*;—if this opens by regular valves it is *dehiscent*, otherwise *indehiscent*. Dehiscence may take place either by splitting through the partitions, when it is *septicidal* or through the back of each carpel; the latter mode is called *loculicidal*. That form of pod which is peculiar to the Mustard Family is called a *Silique* (Fig. 23); this is composed of two carpels, the two valves at maturity falling away from the two parietal placentæ which remain as a frame-work or *Replum*,—in this the pod is two-celled by the stretching of a delicate false partition between the two placentæ. A short pod of this kind is called a *Silicle* or *Pouch* (Fig. 27).

Some capsules open by a transverse line, the top coming off as a lid; such a pod is called a *Pyxis* and this kind of dehiscence, *circumsissile*. (Fig. 42).

51. A berry is a fruit, which like the grape, is pulpy throughout; if the rind becomes hardened while the interior remains soft, a *Gourd-fruit* or *Pepo* is formed. A *Pome*, as the Apple and Pear, is composed of the fleshy and enlarged calyx-tube; the carpels being the thin plates which surround the seeds in its centre (Fig. 90). Fleshy and pulpy fruits are of course indehiscent. An *Akene* or *Achenium* is a small dry one-seeded fruit, often popularly called seed, as in the Crowfoot (Fig. 6) and in the Composite Family (Fig. 126 & 140). A *Grain* or *Caryopsis* is like an akene but with the pericarp closely adherent to the whole surface of the seed. An *Utricle* is an akene with very thin walls. A *Key* or *Samara* is a kind of akene with a wing, as in the Ash or Maple (Fig. 68); in the latter case two are united. *Multiple fruits* result from several flowers closely crowded together, as in the Mulberry. A *Cone* or *Strobile* is a scaly-inbricated multiple fruit.

52. The seed has already been described as containing an embryo with or without albumen; it has two coats, the inner of which is very thin and delicate and not always to be made out,—the outer one, the *Testa*, is much thicker and often even hard and bony, and is variously

marked. Sometimes it is expanded into a wing, and at others, as in the Milkweed, furnished with a tuft of hairs which serve to waft it from place to place. The mark left by the separation of the seed-stalk or funiculus is called the *Hilum*, which is conspicuous in the Bean and Horse-chestnut.

53. SYSTEMATIC BOTANY is that branch of the science which groups together plants according to their resemblances in structure. Individual plants that are so much like each other that they may be conceived to have a common origin, are comprised under the head of *Species*. Plants are apt to vary much, from local influences, and to deviate somewhat from the regular form of the species; these departures from the typical form are considered as *Varieties*. Where varieties perpetuate their peculiarities from one generation to another by the seed, they form *Races*; of which our cultivated plants furnish numerous examples. Those species which have many points of resemblance, though differing in minor characters, are grouped together in *Genera*, and genera again are collected into *Families* or *Orders*, these into *Classes* founded upon fundamental differences in the structure of the embryo, stem, &c. The next group in the ascending order is that of *Series*, where the whole vegetable kingdom is separated into two great series, the one comprising the *Flowering* and the other the *Flowerless Plants*.

54. In the descriptions of plants, the account given of the Order should apply to all the genera included in it; that of the Genus should include the important characters of all the species it comprises; and that of a Species should present those points which distinguish it from other species in the same Genus.

The names given to plants are double, corresponding to the surname and baptismal names of persons. The name of the Genus is placed first, followed by that of the species; the latter is usually in the adjective form.

55. Of course all the plants that one meets with will not be found in this work, it being intended only to include those which are to be found in cultivated sections. In order to find the name and description of any particular plant, the first thing to be settled, (it being of course a flowering plant.) is, to which class to refer it; this is usually indicated by the leaves, or, at any rate, it may be ascertained by making a cut across the stem. If it be an exogenous stem, then it must be ascertained whether the corolla is present, and if present, whether it is composed of many pieces or is a more or less entire single one. These preliminaries being settled, a reference to the Key and a little patience will soon determine the Family to which it belongs. If upon referring to the description, the plant in question agrees with the character given to the Family, then the genus is to be ascertained, and after this the species.

A KEY

TO THE

NATURAL ORDERS OR FAMILIES

OF PLANTS DESCRIBED IN THIS WORK.

SERIES 1. FLOWERING PLANTS. Plants with flowers, having *stamens* and *pistils*, and producing *seeds*, which contain an *embryo*.

CLASS I. EXOGENOUS or DICOTYLEDONOUS PLANTS. *Stems* distinctly formed of *bark*, *wood* and *pith*; the *wood* in stems lasting from year to year, increasing by *annual layers* on the outside next the bark. Leaves netted-veined. *Embryo* with two opposite cotyledons, or (in the Pine family) several in a whorl. Parts of the flowers usually in fives or fours.

SUB-CLASS 1. ANGIOSPERMS. *Pistil* a closed ovary, containing ovules and becoming the fruit. Cotyledons 2.

DIVISION I. POLYPETALOUS: *Calyx* and *corolla* both present (except in some genera of Order I); the petals entirely separate (except in Order XXX., where they are sometimes united).

A. STAMENS NUMEROUS, MORE THAN 10.

1. *Stamens* borne on the receptacle, entirely free from the calyx, corolla or ovary.

	PAGE.
Pistils more than one, entirely separate from each other.	
Herbs with perfect flowers and divided leaves.	RANUNCULACEÆ, 26
Small trees with 6-petalled flowers and entire leaves.	ANONACEÆ, 36
Pistils numerous, grown together one above another, covering the long receptacle.	MAGNOLIACEÆ, 34
Pistils only 1, or 2 – several, more or less completely united into one.	
Ovary simple and 1-celled, with only one placenta.	
Petals large. Filaments shorter than the anthers.	Podophyllum in BERBERIDACEÆ, 36
Petals 4 and irregular, or else very small.	RANUNCULACEÆ, 26

	PAGE.
Ovary compound, with many seeds from a central placenta.	PORTULACACEÆ, 62
Ovary compound, 1 - 5-celled; if 1-celled, with 2 - several placentæ on the walls.	
Sepals falling when the flower opens, fewer than the petals. Herbs with milky or colored juice.	PAPAVERACEÆ, 40
Sepals falling after blossoming, 5 in number. Trees.	TILIACEÆ, 68
Sepals remaining beneath the fruit.	
Leaves all opposite, with transparent or dark-colored dots.	HYPERICACEÆ, 54
2. <i>Stamens connected with the base of the petals, and these borne on the receptacle.</i>	
Filaments united in a tube or column; anthers kidney-shaped, 1-celled.	MALVACEÆ, 63
3. <i>Stamens and petals united with and apparently borne on the calyx (perigynous).</i>	
Petals many, in several rows. Shrubs.	CALYCANTHACEÆ, 135
Leaves with stipules, alternate.	ROSACEÆ, 112
Leaves without stipules.	
Pod many-seeded.	
Shrubs, leaves opposite. Pod with several cells. Philadel-	
[phus in	SAXIFRAGACEÆ, 143
Herbs; leaves fleshy. Pod 1-celled, opening by a lid.	PORTULACACEÆ, 62
Pod 2-seeded, 2-beaked. Shrubs or trees.	
Petals sometimes wanting.	HAMAMELACEÆ, 144

B. STAMENS 10 OR FEWER.

1. *Corolla irregular. (Pistil one.)*

Leaves opposite, palmately compound. Calyx 5-toothed. Shrubs or trees.	SAPINDACEÆ, 87
Leaves alternate, with stipules.	
Filaments often united. Two lower petals approaching or joined. Pod simple with only one row of seeds.	LEGUMINOSÆ, 93
Leaves alternate, without stipules.	
Flower 1-spurred. Stamens 8. Fruit of 3 thick and closed pieces.	TROPEOLACEÆ, 73
Flower somewhat papilionaceous. Stamens 4 - 8 in two sets: anthers 1-celled, opening at top. Fruit a 2-celled, 2-seeded pod.	POLYGALACEÆ, 92

2. *Corolla nearly or quite regular.*

PAGE.

Stamens as many as the petals and opposite them.

Pistil and style 1 (the latter sometimes cleft at the summit).

Anthers opening by uplifted valves.

BERBERIDACEÆ, 36

Anthers opening lengthwise.

Woody vines. Calyx minute; petals falling very early.

VITACEÆ, 81

Shrubs. Calyx larger, its divisions 4-5.

RHAMNACEÆ, 85

Herbs. Sepals 2: petals 5: stigmas 3.

PORTULACACEÆ, 62

Stamens as many as the petals and alternate with them, or twice as many, or of some unequal number.

Calyx-tube adhering to the surface of the ovary.

Stamens more or less united with each other. Flowers monoecious.

CUCURBITACEÆ, 138

Stamens distinct, as many or twice as many as the petals.

Seeds many in a 1-celled berry.

Shrubs.

GROSSULACEÆ, 136

Seeds many, in a 2-celled or 1-celled pod. Styles 2.

SAXIFRAGACEÆ, 143

Seeds many, in a 4-celled pod. Style 1: stigmas 4.

ONAGRACEÆ, 135

Seeds only 1 in each cell. Border of calyx obscure.

Flowers in small axillary clusters. Pod 2-beaked. Shrubs or trees.

HAMAMELACEÆ, 144

Styles 2: fruit dry. Herbs with flowers in compound umbels.

UMBELLIFERÆ, 145

Styles 3-5 (rarely 2); fruit a berry. Shrubs or herbs, with flowers in simple or paniced umbels.

ARALIACEÆ, 155

Style 1. Flowers in cymes or clustered in heads, sometimes surrounded by an involucre.

CORNACEÆ, 157

Calyx free from the ovary, at least from the fruit.

Leaves with transparent or blackish dots.

Leaves simple, entire and opposite.

HYPERICACEÆ, 54

Leaves compound or divided.

RUTACEÆ, 74

Leaves without transparent dots.

Pistils more than one. Leaves with stipules.

ROSACEÆ, 112

Pistils 2, nearly distinct. Stipules none.

SAXIFRAGACEÆ, 143

Pistil 1, simple, 1-celled: style and stigma 1.

LEGUMINOSÆ, 93

	PAGE.
Pistil 1, compound; either its styles, stigmas or ovary cells more than 1.	
Style 1, entire, or barely cleft at top.	
Stamens united into a tube, with anthers in its orifice.	
Trees with odd-pinnate or bipinnate leaves.	MELIACEÆ, 69
Stamens distinct.	
Anthers opening by holes or chinks at top.	
Anthers opening across the top.	ERICACEÆ, 207
Anthers opening lengthwise.	
Herbs. Stamens 6, 2 of them shorter.	CRUCIFERÆ, 42
Woody plants. Fruit few-seeded.	
Stamens fewer than the 4 long petals.	OLEACEÆ, 264
Stamens as many as the broad petals.	CELASTRACEÆ, 86
Styles or sessile stigmas 2-6, or style 2-5-cleft.	
Ovary and fruit 1-celled.	
One-seeded. Shrubs.	ANACARDIACEÆ, 77
Several- or many-seeded.	
Seeds in the centre of the pod.	CARYOPHYLLACEÆ, 56
Seeds on the walls or bottom of the pod.	SAXIFRAGACEÆ, 143
Ovary with 2-5 or more cells.	
Sessile stigmas and stamens 4-6.	AQUIFOLIACEÆ, 216
Styles or long stigmas 2: fruit 2-winged.	ACERACEÆ, 89
Styles or divisions of the style 5.	
Stamens 5: pod partly or completely 10-celled.	LINACEÆ, 70
Stamens 10: pod 5-celled. Leaves compound.	OXALIDACEÆ, 72
Stamens 10 (or fewer): styles united with a long beak, splitting from it when ripe.	GERANIACEÆ, 71

DIVISION II. MONOPETALOUS: *Calyx* and *corolla* both present; the petals more or less united.

A. TUBE OF THE CALYX COHERENT WITH THE OVARY, *the corolla apparently inserted on the ovary.*

Stamens united by their anthers, and

Not by their filaments. Flowers in heads which are furnished with an involucre.

COMPOSITÆ, PAGE.
168

Also more or less by their filaments. Flowers not in heads.

Corolla irregular, cleft down one side.

Flowers perfect.

LOBELIACEÆ, 206

Corolla regular. Flowers monoecious.

Tendrils bearing vines.

CUCURBITACEÆ, 138

Stamens separated from each other, and

Inserted on the corolla. Leaves opposite or whorled.

Leaves opposite, without stipules.

Flowers in an involucre head.

DIPSACEÆ, 167

Flowers not involucre.

Stamens 2 - 3. Corolla 5-lobed.

VALERIANACEÆ, 165

Stamens 4 - 5. Corolla 4 - 5-lobed.

CAPRIFOLIACEÆ, 160

Leaves opposite with stipules between them, or whorled without stipules.

RUBIACEÆ, 163

Inserted with but not on the corolla.

Stamens twice as many as the lobes of the corolla.

Woody plants. Huckleberry sub-family

[in ERICACEÆ, 207

B. CALYX FREE FROM THE OVARY; *the corolla on the receptacle.*

1. *Stamens more in number than the lobes of the corolla.*

Leaves compound. Flowers commonly irregular.

Pod 1-celled.

LEGUMINOSÆ, 93

Leaves simple or palmately divided. Stamens united into a tube.

MALVACEÆ, 63

Leaves simple, undivided. Stamens united only at the base, or separate.

Stamens on the corolla, twice or four times as many as its lobes.

EBENACEÆ, 217

Stamens free from the corolla, twice as many as its lobes.

ERICACEÆ, 207

2. *Stamens as many as the 5, 4 or rarely 6 - 7 lobes of the regular corolla.*

Stamens alternate with the lobes of the corolla, 5 or rarely 4.

Inserted on the receptacle.

ERICACEÆ, 207

Inserted on the corolla, but connected more or less with the stigma. Juice milky.

Filaments monadelphous.

ASCLEPIADACEÆ, 261

	PAGE
Inserted on the corolla free from the stigma.	
Style none: stigmas 4 – 6: corolla very short, deeply cleft.	AQUIFOLIACEÆ, 216
Style 1, rarely 2, sometimes 2-cleft or 3-cleft.	
Ovary deeply 4-lobed, making 4 akenes.	
Stamens 4. Leaves opposite, aromatic.	LABIATÆ, 228
Stamens 5. Leaves not aromatic.	BORRAGINACEÆ, 241
Ovary and pod 1-celled: the seeds on the walls.	
Leaves entire and opposite.	GENTIANACEÆ, 260
Ovary and fruit with 2 or more cells.	
Stamens 4, long. Flowers in a close spike.	PLANTAGINACEÆ, 218
Stamens 5. Pod or berry many-seeded.	
Flower not quite regular.	
Style entire.	SCROPHULARIACEÆ, 223
Flower quite regular. Stamens all alike.	SOLANACEÆ, 250
Stamens 5. Pods with few large seeds. Twining herbs.	CONVOLVULACEÆ, 246
3. <i>Stamens always fewer than the lobes of the calyx or corolla, 2 – 4.</i>	
Corolla more or less irregular, mostly 2-lipped.	
Ovary 4-lobed, making 4 akenes. Stems square; leaves opposite, aromatic.	LABIATÆ, 228
Ovary and fruit 4-celled and 4-seeded. Stamens 4.	VERBENACEÆ, 228
Ovary and pod 2-celled, with many large and winged seeds.	BIGNONIACEÆ, 220
Ovary and fruit irregularly 4 – 5-celled, with many large seeds.	
Ovary and pod 2-celled, with many or few small seeds.	SCROPHULARIACEÆ, 223
Corolla regular. Stamens only 2.	
Corolla 4-lobed or 4-parted. Shrubs or trees.	OLEACEÆ, 264

DIVISION III. APETALOUS: Corolla none; the floral envelopes being in a single series (calyx), or sometimes wanting altogether.

A. FLOWERS NOT IN AMENTS OR CATKIN-LIKE HEADS.

1. *Seeds many in each cell of the ovary or fruit.*

Calyx with its tube coherent with the 6-celled ovary.	PAGE. ARISTOLOCHIAEÆ, 268
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Calyx free from the ovary.

Pod 3-celled or 1-celled, with 3 or more styles.	Mollugo, &c., in CARYOPHYLLACEÆ, 56
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Pod or berry 1-celled and simple.	RANUNCULACEÆ, 26
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2. *Seeds only 1 – 2 in each cell of the ovary or fruit.*

Pistils more than one to the flower, and separate from each other.

Calyx present and petal-like. Stamens on the receptacle.	RANUNCULACEÆ, 26
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Calyx present; the stamens inserted on it. Leaves with stipules.	ROSACEÆ, 112
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Pistil only 1, simple, or formed of two or more, with their ovaries united.

Styles 10. Fruit a 10-seeded berry.	PHYTOLACCACEÆ, 270
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Styles or stigmas 2 – 3.

Herbs with sheathing stipules and entire leaves.	POLYGONACEÆ, 278
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Herbs with separate stipules and compound or cleft leaves.	URTICACEÆ, 291
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Herbs with milky juice: stipules deciduous or none, and stigmas often forked.	
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Fruit splitting into 2 – 3 2-valved pods.	EUPHORBIACEÆ, 287
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Herbs without stipules, and

Without scaly bracts. Flowers small and greenish.	CHENOPODIACEÆ, 270
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With scaly bracts around and among the flowers.	AMARANTACEÆ, 275
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Shrubs or trees, with opposite leaves.

Fruit a pair of keys.	ACERACEÆ, 89
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Shrubs or trees, with alternate leaves and deciduous stipules.

Stamens on the throat of the calyx, alternate with its lobes.	RHAMNACEÆ, 85
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Stamens on the bottom of the calyx.	URTICACEÆ, 291
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Style 1; stigma 2-lobed. Fruit a key. Leaves pinnate.	OLEACEÆ, 264
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Style or sessile stigma 1, and simple.

Calyx of 6 petal-like colored sepals: stamens 9 – 12: anthers opening by valves. Aromatic shrubs or trees.	LAURACEÆ, 285
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Calyx in the sterile flowers of 3 – 5 greenish sepals: stamens the same number.

Flowers monœcious or dioecious.	URTICACEÆ, 291
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B. FLOWERS, ONE OR BOTH SORTS, IN AMENTS OR CATKIN-LIKE HEADS.

Twining dioecious herbs; fertile flowers only in short aments.	Humulus in	URTICACEÆ,	PAGE 291
Shrubby plants, parasitic on trees. Fruit a berry.		LORANTHACEÆ,	286
Trees or shrubs.			
Sterile flowers only in aments. Flowers monoecious.			
Leaves pinnate. Ovary and fruit without an involucre.		JUGLANDACEÆ,	302
Leaves simple. Nuts one or more in a cup or involucre.		CUPULIFERÆ,	307
Flowers of both kinds in aments or close heads.			
Leaves palmately-veined or lobed.			
Calyx 4-cleft, in the fertile flowers becoming berry-like. Morus in		URTICACEÆ,	291
Calyx none: flowers in round heads.		PLATANACEÆ,	301
Leaves pinnately-veined.			
Flowers dioecious, 1 on each scale.			
Pod many-seeded.		SALICACEÆ,	328
Flowers monoecious, the fertile ones 2 or more under each scale.		BETULACEÆ,	324
Flowers only 1 under each fertile scale.			
Fruit 1-seeded.		MYRICACEÆ,	323

SUB-CLASS 2. GYMNOSPERMS. *Pistil* represented by an open *scale* or *leaf*, or sometimes entirely wanting; the ovules and seeds naked.

Flowers monoecious or dioecious. Stems branched. Leaves simple.	CONIFERÆ,	333
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CLASS II. ENDOGENOUS OR MONOCOTYLEDONOUS PLANTS. Stem not distinguishable into *bark*, wood and *pith*. Leaves mostly parallel-veined and sheathing at base. Parts of the *flower* usually in threes. Embryo with a single *cotyledon*.

1. Flowers densely crowded on a spadix with or without a spathe. Herbs. The small and crowded flowers either naked or with a small perianth.

Spadix with a large spathe surrounding it.	}	ARACEÆ,	PAGE. 344
Flower generally naked: fruit a berry.			
Spadix without a spathe. Perianth of 6 pieces.			

Spadix without any proper spathe: perianth none; fruit an akene.	TYPHACEÆ,	347
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2. Flowers not on a spadix, but variously disposed, having a calyx and corolla, or a 6-leaved or 6-lobed (rarely 4-lobed) perianth colored and corolla-like.

Perianth not adherent to the ovary, and

Of 3 greenish sepals and 3 distinct and colored petals.

Pistils many, in a ring or head, forming akenes.	ALISMACEÆ,	347
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Pistil 1, 3-celled, many-several-seeded: style one.

Slender scurfy-leaved plants, growing on trees.	BROMELIACEÆ,	349
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Of mostly 6 petal-like leaves in 2 ranks, 3 outside and 3 inside, or else 6- (rarely 4-) lobed, all colored alike.

Stamens 6, or as many as the divisions of the perianth, all alike.

Anthers turned outward, i. e., on the outer side of the filament.

Leaves alternate with side tendrils, netted-veined between the ribs. Flowers dioecious: styles or sessile stigmas 3.

SMILACEÆ,	350
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Anthers turned inwards, i. e., on the inner side of the filament: style 1: stigmas 1-3.

LILIACEÆ,	351
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3. Flowers not on a spadix and without any colored or corolla-like perianth, but having glumes, i. e., husk-like or scale-like bracts. Stems rush-like or straw-like.

Glumes 6 in a whorl to each flower, like a calyx.	JUNCACEÆ,	358
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Glume one to each flower, the flower in its axil.

Flowers collected into heads or spikes.	CYPERACEÆ,	358
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Glumes 2-4 to each flower, of 2 sorts.	GRAMINEÆ.	
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AMERICAN WEEDS AND USEFUL PLANTS.

SERIES I.

FLOWERING PLANTS.

PLANTS with *flowers*, having *stamens* and *pistils*, and producing *seeds*, which contain an *embryo*.

CLASS I.

EXOGENOUS, OR DICOTYLEDONOUS PLANTS.

STEMS distinctly formed of *bark*, *wood* and *pith*; the *wood*, in stems lasting from year to year, increasing by *annual layers* on the outside next the bark. *Leaves* netted-veined. *Embryo* with two opposite *cotyledons*, or rarely several in a whorl. Parts of the flower usually in fives or fours.

SUB-CLASS I.

ANGIOSPERMOUS EXOGENS.

PISTIL a closed ovary, containing *ovules* and becoming the fruit. *Cotyledons* 2.

DIVISION 1.

POLYPETALOUS EXOGENS.

FLORAL ENVELOPES consisting generally of both *calyx* and *corolla*, with the *petals* mostly distinct.*

* In the *Ranunculaceæ* sometimes the petals are absent, and in *Leguminosæ* and *Cucurbitaceæ*, some species have the petals more or less united.

ORDER I. RANUNCULA'CEÆ. (CROWFOOT FAMILY.)

Herbs, or woody vines, with a colorless and often acrid juice, and usually dissected leaves, without stipules; petals sometimes wanting, and the calyx, which is often colored like a corolla, hypogynous; the sepals, petals, numerous stamens, and many or few (rarely single) pistils, all distinct and unconnected. Fruit either dry pods, akenes or berries 1-several-seeded; seeds with a firm, fleshy albumen, and a minute embryo.

In many plants of this family, the juice is so powerfully acrid as to produce blistering; the acridity in most is, however, destroyed by heat, and in many it is lost in drying. Many of the plants belonging to the order are cultivated for ornament, as the Columbine, Clematis, Anemone, Larkspur, Peony, &c. Some, as the Aconite, are eminently poisonous, while others, like Coptis, are simple bitter tonics.

§ 1. Petals none. Sepals colored and petal-like. Pistils several, becoming akenes in fruit. Upper leaves sometimes forming an involucre near the flower.

Akenes several, not ribbed; three upper simple leaves forming a calyx-like involucre near the flower. Radical leaves 3-lobed. 1. HEPATICA.

Akenes several, ribbed. Involucre none. Leaves 3-4 times compound. 2. THALICTRUM.

§ 2. Sepals and petals present, the latter with a small scale at the base inside.

Akenes in a head. 3. RANUNCULUS.

§ 3. Sepals petal-like. Petals, when present, small and irregular. Pistils forming several seeded pods, or follicles.

Flower regular.

Petals none. Sepals yellow. Leaves kidney-shaped. 4. CALTHA.
Petals small, hollowed at the apex. Sepals whitish.
Pistils stalked. 5. COPTIS.

Flower irregular.

Upper sepal spurred. Petals 4, of two forms. 6. DELPHINIUM.
Upper sepal hooded. Petals 2, long-clawed. 7. ACONITUM.

§ 4. Sepals petal-like, falling off as the flower opens. Petals small, 2-horned at the apex.

Flowers in a long raceme. 8. CIMICIFUGA.

1. HEPATICA. Dillen. LIVERLEAF.

[Greek, *Hepar*, the liver, from a fancied resemblance in the leaves.]

Involucre of 3 simple leaflets, close to the flowers, resembling a calyx. *Sepals* 6-9 in 2-3 rows, colored and petal-like. *Petals* none. *Akenes* in a loose head, compressed, hairy. *Leaves* all radical. *Flowers* single, on hairy scapes.

1. *H. tri'loba*, *Chaix*. Leaves broadly heart-shaped, or somewhat kidney-shaped, with 3 obtuse lobes; sepals blue or purplish.

THREE-LOBED HEPATICA. Liverwort. Liverleaf.

Leaves on petioles 3-5 inches long. *Scapes* several, 4-6 inches long, silky-villous. *Involucre* villous externally.

Open woodlands; common: April.

Obs. One of the earliest flowers of spring, blooming in rocky woods as soon as the snow disappears. The leaves remain through the winter, and when old are purplish below. A variety, or what is by some considered a species (*H. acutiloba*, *DC.*), has very acute lobes to the leaves. This plant, which has no especial interest to the agriculturist; is noticed on account of some popular reputation it has as a remedy. It forms a slightly astringent mucilaginous infusion, which is used by the "herb doctors" in diseases of the lungs, in which it is probably as harmless as any other warm drink. *

2. THALIC'TRUM, L. MEADOW-RUE.

[A name of obscure derivation.]

Often *diœcious* or *polygamous*. *Sepals* 4-5, petal-like, soon falling. *Petals* none. *Akenes* 4-15, ribbed or grooved, pointed by the short style. *Perennial* herbs, with 2-3-ternately compound *leaves* and corymbose or paniculate *flowers*.

1. *T. Cornu'ti*, L. *Diœcious* or *polygamous*; leaves ternately compound, divided to the base; those of the stem without common petioles; leaflets 3-lobed at the apex, glaucous and more or less pubescent; flowers white, in loose compound panicles.

CORNUTUS'S THALICTRUM. Meadow-rue.

Stem 3-6 feet high, rather stout, branching, furrowed and hollow.

Obs. This is very common in wet meadows and along rivulets, where its showy white flowers are likely to attract the notice of the farmer. It can hardly be considered a troublesome plant. *

3. RANUN'CULUS, L. BUTTERCUP. CROWFOOT.

[Latin, *Rana*, a frog; the plant often growing where that animal is found.]

Sepals 5. *Petals* 5, with a scale or pit on the inside, at the base. *Stamens* mostly numerous. *Akenes* numerous, compressed, ovate, pointed, disposed in roundish or cylindrical heads. Annual or perennial *herbs*, with mostly radical *leaves*, and solitary or somewhat corymbed mostly yellow *flowers*.



1. *R. bulbosus*, L. Hairy; radical leaves petiolate, trifoliate and somewhat pinnately divided; leaflets usually 3-cleft, incisely toothed, the middle or terminal one petiolulate; stem erect, from a solid bulb-like base; peduncles furrowed; calyx reflexed, shorter than the petals.

BULBOUS RANUNCULUS. Buttercups. Crowfoot.

Fr. Bassinet. *Germ.* Knolliger Ranunkel. *Span.* Boton de Oro.

Root perennial. *Stem* about a foot high; often several from the same root, more or less branched, clothed with appressed hairs. *Leaves* variously cut; the segments cuneate. *Peduncles* 2-6 inches long, sulcate-angular. *Petals* sometimes more than 5 (flowers double); deep yellow and shining. *Carpels* in a globose head.

Pastures and meadows: introduced. Native of Europe. *Fl.* May: *Fr.* July.

Obs. This foreigner is extensively naturalized, and is considered quite a nuisance by farmers. The fleshy bulb is highly acrid, affording a powerful rubefacient, and even causing ulcers when externally applied. Beggars in Europe, it is said, use it for this

purpose, in order to excite sympathy. I do not know that cattle have been injured by it, but as it is a troublesome weed, when fully introduced, it may be well for farmers to know the plant, and eradicate it upon its first appearance in their grounds.

2. *R. a'cris*, L. Hairy; stem erect, not bulbous at base; leaves 3-divided, divisions all sessile and 3-parted, their segments cut into lanceolate or linear lobes; peduncles not furrowed; calyx spreading.

ACRID RANUNCULUS. Tall Crowfoot. Buttercups.

Perennial. *Stem* 1-2 feet high, branched above, sparingly leafy, and with the petioles clothed with spreading hairs, but sometimes nearly smooth. *Flowers* nearly as large, but not so deep yellow, as in the preceding.

Meadows and pastures. Native of Europe. June- Aug.

Obs. Like the foregoing, this is an introduced weed; it is common in New England and in New York State, though, according to Dr. Darlington, it has not become abundant in Pennsylvania. Both species

FIG. 1. Bulbous Crowfoot, or Buttercups (*Ranunculus bulbosus*), the upper and lower portions of the stem. 2. A separate petal; with a scale at the base.



A.H.

FIG. 3. Tall Crowfoot (*Ranunculus acris*), reduced. 4. An enlarged flower divided, to show the insertion of the distinct parts on the receptacle. 5. A head of achenes. 6. A separate achene.

are popularly known as Buttercups, and in some localities are so abundant in meadows, as to appear at a distance like an unbroken sheet of golden yellow. On account of their very acrid juice, cattle do not eat them in their fresh state, but when cut with the grass and dried, the acridity is dissipated, and they become apparently quite innocuous. Before the introduction of Spanish Flies, these and other species were used to produce blisters; being uncertain in their operation, they are now seldom employed. About a dozen other species are to be found in the woodlands and meadows, and a few aquatic ones in streams and ponds. The only one of these which assumes the character of a weed at the north is *R. repens*, L., the long stems of which are usually prostrate and rooting at the joints; it has large bright flowers, and is sometimes common in wet meadows. *R. muricatus*, L., is an introduced species, found in the fields in Virginia and southward. It has roundish, mostly 3-lobed leaves, and the akenes beset with spiny tubercles or bristles. Both *R. bulbosus* and *R. acris* frequently become perfectly double by the transformation of their organs of fructification into petals, and are frequently cultivated in gardens. In the double *R. bulbosus*, the flower is proliferous, the receptacle producing, instead of a head of pistils, a bud which developes as the old flower falls away; this is repeated several times in succession. *

4. CAL'THA, L. MARSH MARIGOLD.

[Greek, *Kalathos*, a goblet; from the cup-like form of the flower.]

Sepals 4 – 10. *Petals* none. *Pistils* 5 – 10, without *styles*, forming in fruit many-seeded, compressed, spreading *pods*. Smooth *perennials*, with large round or heart-shaped entire *leaves*.

L. C. palus'tris, L. Stem nearly erect, hollow, furrowed; leaves round, heart-shaped or kidney-shaped, often wider than long, crenate or nearly entire.

MARSH CALTHA. Marsh Marigold. Cowslip.

Stem 5 – 10 inches high, succulent, sometimes branched. Radical leaves on *petioles* 3 – 6, and finally often 12 – 15 inches long. *Flowers* an inch or more in diameter, few, somewhat corymbose, bright yellow.

Swamps and wet meadows; common at the north. April.

O's. This plant has considerable acridity when fresh, but heat destroys it; it is much used as a pot herb or "greens" in early spring. In New England its popular name is Cowslips (or corrupted into "cows lops"). It has no botanical relation to the Cowslip nor to the Marigold. *

5. COP'TIS, Salisb. GOLDTHREAD.

[Greek, *Kopto*, to cut; on account of its divided leaves.]

Calyx of 5 – 7 petal-like, deciduous *sepals*. *Petals* as many as the *sepals*, small, thickened, and hollow at the apex. *Stamens* 15 – 30, shorter than the *sepals*. *Pistils* 3 – 7, each upon a short stalk, which lengthens as the

fruit matures. *Pods* membranaceous, spreading, pointed with the short, sometimes recurved *style*, few-seeded. Low, slender, smooth *perennials* with trifoliate *leaves*, which survive the winter, and small white *flowers* borne on *scapes*.

1 *C. trifo'lia*, *Salisb.* Leaves ternately divided; leaflets wedge-obovate, sharply toothed, obscurely 3-lobed; scape 1-flowered.

THREE-LEAVED COPTIS. Goldthread. Mouth-root.

Rhizoma horizontal, creeping; *fibres* bright yellow. *Leaves* on long *petioles*, very smooth and shining; *leaflets* about an inch long. *Scape* slender but somewhat rigid and wiry, 3-6 inches long. *Flowers* about two-thirds of an inch in diameter. *Sepals* obtuse, white, sometimes purplish underneath. *Petals* much shorter than the *sepals*, yellow at the base.

Obs. This beautiful little evergreen is found in boggy places and in damp woods from Maryland to Greenland. The long bright yellow fibres of the root have caused it to receive the common name of Goldthread. It is purely bitter, without any astringency, and is used in medicine as a tonic. In some places it is a domestic remedy for the sore mouths of children; whence the name "Mouth-root." "That eminent naturalist, JOHN ELLIS, in a letter to LINNAEUS, dated London, April 25, 1758, says: 'Mr. COLDEN, of New York, has sent Dr. Fothergill a new plant, described by his daughter (Miss JANE COLDEN). It is called *Fibraurea*, Gold Thread. This young lady merits your esteem and does honor to your system. She has drawn and described 400 plants in your method only: she uses the English terms. Her father has a plant called after him, *Coldenia*; suppose you should call this *Coldenella*, or any other name that might distinguish her among your genera.' LINNAEUS, however, referred the plant to his genus *Helleborus*, and when it was subsequently ascertained to be distinct, SALISBURY, regardless alike of gallantry and Justice, imposed on it the name of *Coptis*."—*Memoirs of Bartram and Marshall*, p. 20.

6. DELPHINIUM, L. LARKSPUR.

[Greek, *Delphin*, a dolphin; from a fanciful resemblance in the flower.]

Sepals petaloid, irregular, the upper one produced into a spur at base. *Petals* 4, irregular, the two upper ones with a spur-shaped appendage at base inclosed in the spur of the calyx, sometimes united. *Ovaries* 1-5, mostly 3. *Follicles* many-seeded. Annual or perennial *herbs*. *Leaves* petiolate, palmately divided. *Flowers* in terminal racemes.

1. *D. Consol'ida*, L. Stem erect, with spreading branches; leaves many-parted, the segments linear; flowers few, in loose racemes; pedicels longer than the bracts; petals united; pod solitary, smooth.

SOLDER DELPHINIUM. Lark-spur. [Caballero.

Fr. Pied d'Alouette. Germ. Der Rittersporn. Span. Espuela de

Root annual. Stem about two feet high, and with the foliage and flowers somewhat pubescent. Flowers blue or violet-purple, sometimes the petals are multiplied into double flowers.

Grain fields and waste places: introduced. Native of Europe. Fl. July. Fr. August.

Obs. This plant (which gets its specific name from a supposed virtue in soldering or uniting wounded flesh,) has strayed from the gardens, in some places, and is an unwelcome intruder in grain fields and other cultivated grounds. This, and a kindred species, (*D. Ajacis*, L. with few



erect branches, longer and more crowded racemes,) are so common in gardens, that it requires some attention to prevent them from trespassing on the farm. There are several other species cultivated for ornament, among them the curious Bee Larkspur (*D. ELATUM*), which has its

FIG. 7. Field Larkspur (*Delphinium Consolida*). 8. Upper sepal. 9 & 10. Lateral sepals. 11. Lower sepals. 12. United petals.

dark bearded petals folded up in such a way as to resemble an insect in the centre of the flower.

7. ACONITUM, Tournef. MONKSHOOD.

[The ancient name.]

Sepals petal-like, irregular, the *upper one* hooded and larger than the others. *Petals* 2 (the 3-lower entirely wanting or resembling sterile stamens), small spur-shaped bodies on a long slender *claw*, concealed under the hood. *Pistils* 3-5. *Pods* several-seeded. Acrid and poisonous *perennial herbs* with palmately divided *leaves*, and racemes or panicles of showy *flowers*.

A. NAPEL'LUS, L. Flowers racemose on short pedicels; hooded sepal semicircular; divisions of the leaves parted into linear lobes; root fusiform; flowers blue.

MONKSHOOD. Wolfsbane. Aconite.

Root somewhat woody. *Stem* erect, simple, rather stout and very leafy. *Flowers* mostly dark violet or blue.

Cultivated in gardens. Native of Europe. June.

Obs. This is a very variable species of which De Candolle notices 29 varieties, differing in the color of the flowers and division of the leaves; many of these are highly ornamental plants, and are often cultivated. All parts of the plant are highly poisonous; especially is this the case with the root. Death has resulted from mistaking the roots for those of Horseradish in early spring. It is introduced here in order that its poisonous character may be known. *



8. CIMICIF'UGA, L. BUGBANE.

[Latin, *Cimex*, a bug, and *fugare*, to drive away; in allusion to supposed virtues.]

Sepals 4-5, falling soon after expansion. *Petals* (or altered stamens) minute, pedicelled, with 2 horns at the apex. *Stamens* numerous. *Carpels* 1-8, follicular, many-seeded. *Perennial herbs*. *Leaves* bi- or ternately divided. *Flowers* in virgate racemes.

FIG. 13. Monkshood (*Aconitum Napellus*).

1. *C. racemo'sa*, *Ell.* Racemes very long; carpels mostly solitary, ovoid, obliquely beaked by the short thick style.

RACEMOSE CIMICIFUGA. Tall Snake-root. Black Snake-root.

Root large, branching. *Stem* 4-6 feet high, slender, smooth, leafy near the middle, naked above and below, with one or two radical leaves on long erect petioles. *Leaves* ternately decomposed, petiolate; *leaflets* 2-4 inches long, acute or acuminate, unequally incised-dentate, the terminal one larger and often 3-lobed. *Racemes* terminal, branching, 6-12 inches long. *Sepals* 4, orbicular, concave, greenish white. *Seeds* compressed and angular.

Rich woodlands. *Fl.* June. *Fr.* September.

Obs. The white terminal racemes of this plant, when in flower, are quite conspicuous in the woodlands. The stem and leaves, when bruised, emit a disagreeable odor. The root is somewhat mucilaginous and astringent. Although a plant of no agricultural value,—and probably over-rated as a medicine,—the infusion of the bruised *root* is so generally regarded as a sort of *Panacea* for stock (especially for sick cows), that every farmer ought to know it, and be able with certainty to designate it.

ORDER II. MAGNOLIA'CEÆ. (MAGNOLIA FAMILY.)

Trees or *shrubs* with the *leaf-buds* sheathed by membranous *stipules*; large, solitary, hypogynous, polyandrous, polygamous *flowers*; both *sepals* and *petals* colored and arranged in series of threes, imbricated in the bud. *Leaves* alternate, entire or lobed (never serrate). *Stamens* in several rows; *anthers* adnate. *Pistils* mostly packed together and covering the prolonged receptacle. *Seeds* 1-2 in each carpel; *albumen* fleshy; *embryo* minute.

A small but superb family, more ornamental, however, than important in agriculture.

1. MAGNO'LIA, L. MAGNOLIA.

[Named in honor of Prof. *Pierre Magnol*, a French botanist.]

Sepals 3. *Petals* 6-9. *Stamens* with very short filaments and *anthers* opening inwards. *Pistils* crowded on the long receptacle, coherent in a mass, and forming a fleshy and rather woody cone-like fruit; each carpel opening by its dorsal suture. *Seeds* berry-like, 1-2 in each carpel, from which they are suspended when mature by a long thread or *funiculus*. *Buds* conical, the coverings formed of successive pairs of *stipules*.

1. *M. glau'ca*, L. Leaves lance-oblong, obtuse, white beneath; petals roundish-obovate; cones small, oblong.

GLAUOUS MAGNOLIA. Laurel or Small Magnolia. Sweet Bay.

Shrub or *small tree* 4-20, or even 30 feet high, branching; with a smooth, glaucous, aromatic bark. *Leaves* thickish, 4-8 inches long, deciduous at the North but persistent at the South. *Flowers* white, on thick, club-shaped peduncles, 2-3 inches broad, very fragrant.

Swamps from Massachusetts southward, mostly near the coast. June-Aug.

Obs. This charming little tree is well worthy the attention of those who wish to surround their dwellings with attractive objects; it is perfectly hardy, and in cultivation attains a respectable size.

2. *M. acuminata*, L. Leaves oval, acuminate, green and slightly pubescent beneath, deciduous; petals oblong; cones cylindrical.

ACUMINATE MAGNOLIA. Cucumber tree.

Fr. Le Magnolier. **Germ.** Der Gurkenbaum. **Span.** Arbol de Castor.

Tree from 50–80 feet high, and 2–3 or 4 feet in diameter at base. *Leaves* 6–10 or 12 inches long (on vigorous young saplings much larger—as is usually the case with all trees). *Flowers* large, bluish white, often with a tinge of yellow; petals scarcely expanding. *Fruit* sub-cylindric, 3–5 or 6 inches long.

Mountain forests, New York to Georgia. *Fl.* June–July. *Fr.* Sept.–October.

Obs. The green fruit has some resemblance to a *Cucumber* (whence the common name of the tree); and being intensely bitter and somewhat aromatic, a tincture of it, prepared with whiskey, is a popular preventive of autumnal fevers, with those who are fond of an excuse for taking alcoholic medicine.

Others of this genus may be cultivated in favorable localities; among them the Yellow Cucumber Tree (*M. cordata*, *Mx.*), with heart-shaped leaves and cream-colored flowers; the Ear-leaved Cucumber Tree (*M. Fraseri*, *Walt.*), which has leaves a foot in length with auriculate lobes at the base; the Umbrella Tree (*M. Umbrella*, *Lam.*), with leaves 1–2 feet long and tapering at each end; and the Great-leaved Magnolia (*M. macrophylla*, *Mx.*) having leaves 2–3 feet in length with a heart-shaped base. The great Laurel Magnolia (*M. grandiflora*, *L.*), with its thick evergreen leaves, which are rusty beneath, and its large deliciously fragrant flowers, is a native of North Carolina and farther south; it endures the winter as far north as Philadelphia, and should be planted wherever the winter is not too severe. *M. CONSPICUA* and *M. PURPUREA* are Asiatic species often seen in cultivation in city gardens; the former bears white and the latter purple flowers, which in both cases appear in early spring, before the leaves are developed. The bark in all the species is bitter and aromatic, and is sometimes used in medicine.

2. LIRIODEN'DRON, L. TULIP-TREE.

[Greek, *Leirion*, a lily, and *Dendron*, a tree; from its lily-like flowers.]

Sepals 3, reflexed. *Corolla* campanulate; petals 6. *Anthers* extrorse. *Carpels* dry and samara-like, indehiscent, densely imbricated in a cone, 1–2-seeded. A large tree. *Buds* flat.

1. *L. Tulipifera*, L. Leaves dilated, subcordate at base, 3-lobed, the middle lobe broad and emarginately truncate.

TULIP-BEARING LIRIODENDRON. Poplar. Tulip Poplar. Tulip-tree.

Fr. Le Tulipier. **Germ.** Der Tulpenbaum.

Tree 80–120 feet high, and 2 or 3–5 or 6 feet in diameter. *Leaves* 4–6 inches long on old trees and about as wide as long—the side lobes often with a sinus making two points. *Petals* greenish-yellow, with tinges of reddish-orange. *Carpels* produced at apex into a lanceolate-oblong wing, and closely imbricated in a cone on the fusiform receptacle.

Rich woodlands: Canada to Louisiana. *Fl.* May. *Fr.* October.

Obs. The timber of this magnificent tree is highly valued in many branches of the mechanic arts, especially the variety called *yellow Poplar*,

which is generally to be known by its thicker and more deeply-furrowed bark. The hygrometric properties of the wood—particularly of the *white variety*—render it rather objectionable in cabinet furniture (causing it to swell in damp weather); but the yellow Poplar is much esteemed for its mellowness, lightness, and durability. The *bark* of the root, and young tree, is a valuable aromatic bitter. The prevalence of the Tulip-tree, in woodlands, is a pretty sure indication of a good soil.

ORDER III. ANONA'CEÆ. (CUSTARD-APPLE FAMILY.)

Trees or shrubs with naked *buds*, alternate entire and feather-veined *leaves*, without *stipules*, and hypogynous polyandrous *flowers*, with 3 *sepals* and 6 *petals*, in two rows, valvate in the bud. *Anthers* adnate, opening outwards, on very short filaments. *Petals* thickish. *Fruit* pulpy or fleshy. *Seeds* large, with a minute *embryo* at the base of ruminated *albumen*.

There is but one genus in this country. The luscious Custard Apples of the West Indies, and the Chirimoya of Peru are afforded by trees of this order.

1. ASIM'INA, Adans. NORTH AMERICAN PAPAW.

[A name coined from *Asiminier*, of the French colonists.]

Petals 6, increasing in size after the flower opens, the outer series larger and spreading. *Stamens* in a globular cluster, covering the receptacle of the few *pistils*. *Fruits* 1–3, large, oblong or ovoid, pulpy, several-seeded. *Seeds* horizontal, flat, enclosed in a fleshy *aril*. *Shrubs* or *small trees* with an unpleasant odor when bruised; *flowers* axillary and solitary.

1. A. tri'loba, Dunal. Leaves thin, obovate, lanceolate, pointed; outer petals 3–4 times as long as the calyx, roundish ovate.

THREE-LOBED ASIMINA. Papaw.

Stem 10–20 feet high, branched. *Leaves* 6–9 inches long; *petioles* scarcely $\frac{1}{2}$ an inch in length. *Flowers* appearing rather before the leaves; *petals* brownish-purple, veiny, with tinges of yellow within. *Fruit* 1–3 inches long, consisting of 1–3 pulpy berry-like carpels.

Western New York and southward. *Fl.* May. *Fr.* Sept.

Obs. The fruit of this tree is edible in its wild state, and is said to be much improved by cultivation. It is introduced here with the view of inducing those curious in such matters, to try what careful culture may effect in a fruit which is prized by some in its natural condition. *

ORDER IV. BERBERIDA'CEÆ. (BARBERRY FAMILY.)

Shrubs or *herbs*, with alternate (sometimes compound or lobed) *leaves*, and *sepals* and *petals* imbricated in the bud, in 2 or more series of 2–4 each. *Stamens* hypogynous, as many or twice as many as the petals, and opposite them; *anthers* opening by 2 lids hinged at the top (except in *Podophyllum*). *Pistil* only one; *style* short. *Fruit* mostly berry-like. *Seeds* albuminous.

The fruit in this family is usually eatable, while the root, bark and foliage are astringent, or possess cathartic or poisonous qualities.

1. BER'BERIS, L. BARBERRY.

[Name from the Arabic.]

Sepals 6, roundish, bracteolate. *Petals* 6, obovate, with 2 gland-like spots near the base inside. *Stamens* 6, irritable. *Stigma* orbicular, depressed. *Fruit* a 1 – few-seeded berry. *Seeds* erect. Shrubs with acid leaves and berries, and yellow flowers in pendent racemes; wood and inner bark yellow.

1. *B. vulga'ris*, L. Leaves scattered on the young shoots, mostly small with sharp-lobed margins, or reduced to sharp triple spines, from the axils of which, the next season, are produced fascicles of obovate-oblong closely bristle-toothed leaves, and drooping many-flowered racemes; petals entire; berries oblong, scarlet. COMMON BARBERRY. Barberry.

Shrub 3–10 feet high, producing numerous suckers. *Leaves* about an inch and a half long and half an inch wide. *Racemes* 2 inches or more in length. *Berries* about half an inch long. New England and New York. *Fl.* May. *Fr.* Oct.

Obs. This shrub is a native of Europe, and thoroughly naturalized throughout New England, and partially so in the State of New York. A native species (*B. Canadensis*, Pursh.) is found in the Alleghanies, and also in the Himalayas of India. In New England the Barberry abounds along the road sides and in waste places, often forming dense thickets or natural hedges; it sometimes, though rarely, assumes a tree-like form. It is a beautiful shrub, whether bearing its graceful yellow racemes of flowers in spring, or loaded with its coral-like berries in autumn. To those who observe plants closely, it presents several interesting peculiarities; its stamens when touched with a pin, or other hard point, manifest their irritability by springing suddenly towards the pistil, where they remain for some time; the anthers have a curious con-



FIG. 14. Barberry (*Berberis vulgaris*). 15. An enlarged petal, showing the glandular spots at the base. 16. A magnified anther, opening by valves hinged at the top.

trivance for the liberation of the pollen; instead of emitting it, as is usually the case, through a longitudinal slit, there is a little valve or trap-door, hinged at the top, which opens spontaneously. The leaves of the young shoots afford a marked illustration of the nature of some kinds of spines. Though not generally enumerated among the hedge plants, it possesses many qualities which adapt it to this use; being very hardy, long lived, and easily propagated. It was formerly a popular belief, and one which prevails yet to some extent, that the Barberry possessed the power of blasting grain. The fallacy of this idea has been proved; the only injury it can cause the grain is by shading it, which it is very likely to do when allowed to grow, unchecked, along the borders of fields. The berries, preserved in sugar, are in common use in New England, to eat with meat or to form an acid cooling drink in fevers. The inner bark has tonic and purgative properties, said to be somewhat similar to those of rhubarb; it is one of the remedies of the so called "Indian Doctors," according to whom the virtues are essentially modified by the way in which the bark is removed, whether by scraping upwards or downwards.

A variety with reddish foliage, and several Asiatic species, are cultivated. The Mahonias, which are evergreen Barberries with pinnate leaves, are natives of the far west, and are fine ornamental shrubs. *

2. PODOPHYLLUM, L. MAY-APPLE.

[Greek, *Pous*, a foot and *Phyllon*, a leaf; the leaf resembling a web-foot.]

Sepals 6, thin and caducous, not expanding, subtended by 3 caducous bracts. *Petals* 6-9. *Stamens* twice as many as the petals; *anthers* linear-oblong, opening lengthwise by a laterally hinged valve. *Ovary* ovoid, crowned by the thick sessile undulate stigma. *Fruit* a fleshy berry, the numerous seeds crowded on the large lateral placenta, each invested with a pulpy aril. *Herbs* with 2-leaved 1-flowered stems arising from a creeping perennial rootstock.

1. *P. pelta'tum*, L. Stems bearing 2 deeply lobed leaves; flower solitary from the point where the petioles unite.

PELTATE PODOPHYLLUM. May-apple. Mandrake. Hog-apple.

Stems 8-12 inches high, the flowerless ones bearing a single large peltate leaf. *Leaves* 4-6 inches in diameter, the lobes somewhat toothed at the apex. *Flower* white, nearly 2 inches broad. *Fruit* 1-2 inches long, yellowish, slightly acid.

Woodlands, common. *Fl.* May. *Fr.* July-August.

Obs. Besides the common names above given this is known in some parts of the country as Wild Lemon and Raccoon Berry. The fruit is edible and harmless; its taste is mawkish and disagreeable to many persons. Both foliage and root are poisonous; serious results have followed the use of the leaves as greens. The root is a violent purgative, resembling jalap in its action. Although one of the popular names of this plant is Mandrake, it is not related to the Mandrake or Mandragora

of the ancients : notwithstanding its poisonous character (the reason of our noticing it) it is a very respectable herb in comparison with that, which, according to tradition, flourished best under a gallows, and had root resembling a man in shape, uttering terrible shrieks when it was



FIG. 17. Field Poppy (*Papaver dubium*), reduced. 18. A capsule.

torn from the ground and possessing the power of transforming men and beasts. *

ORDER V. PAPAVERACEÆ. (POPPY FAMILY.)

Herbs with a milky or colored juice and regular polyandrous, hypogynous flowers with the parts in twos or fours; *sepals* caducous; *fruit* a 1-celled pod or capsule with 2 or more parietal placentæ; *seeds* numerous, often crested; *embryo* small, at the base of fleshy and oily *albumen*.

Herbs with a white juice. Seeds not crested.

Capsule crowned by the radiate united stigmas.

Herbs with a yellow or orange-colored juice. Seeds crested.

Stigmas 4-6. Pod and leaves prickly.

Stigmas 2. Pod narrow and smooth.

Stigma 2-grooved. Pod oblong, turgid.

1. PAPAVER.

2. ARGEMONE.

3. CHELIDONIUM.

4. SANGUINARIA.

1. PAPA'VER, L. POPPY.

[Derivation of the name not well ascertained.]

Sepals 2. *Petals* 4 (sometimes multiplied). *Stigmas* 4 - 20, sessile, radiating on the summit of the ovary. *Capsule* obovoid, opening by chinks or pores under the edge of the crown formed by the stigmas; *placentæ* extending into the cavity so as to form incomplete partitions. *Flowers* nodding before opening.

1. *P. du'bium*, L. Stem clothed with slender spreading hairs—the peduncles with bristly appressed hairs; leaves pinnately dissected, the segments often incised, decurrent; sepals hairy; capsules obovoid-oblong, smooth.

DUBIOUS PAPAVER. Poppy. Field-poppy.

Fr. Pavot bâtard. *Germ.* Der Saat-Mohn. *Span.* Amapóla.

Root annual. *Stem* 1-2 feet high, somewhat branched below. *Leaves* 2-5 inches long. *Peduncles* terminal, 6-12 inches long, flexuose, leafless. *Petals* pale red or brick dust colored. *Stigmas* about 7-rayed, on a convex disk.

Cultivated grounds; introduced. Native of Europe. *Fl.* May. *Fr.* July, August.

Obs. This has found its way into some districts; and, if unattended to, may become a troublesome weed—as it and the “Corn Poppy” (*P. Rhoëas*, L.) are in Europe. The common or *Opium Poppy*, (*P. somniferum*, L.—a smooth species with stem-clasping leaves)—which yields the most efficacious and soothing of all anodynes—is often seen in the flowerbeds of our gardens. I believe there was an attempt made, near New York, some 30 or 40 years ago, to cultivate that species for the purpose of obtaining *Opium*: but it did not succeed—and perhaps its culture, even if practicable here, is better suited to the Orientals, than to the people of our country.

2. ARGEMO'NE, L. PRICKLY POPPY.

[Greek, *Argema*, a disease of the eye; supposed to be relieved by this plant.]

Sepals mostly 3, prickly. *Petals* 4-6. *Stigmas* 3-6, subsessile, radiate. *Pod* oblong, prickly, opening at the apex by 3-6 valves. *Seeds* crested. *Herbs* with large showy flowers and yellowish juice. *Flower buds* erect.

1. *A. Mexica'na*, L. Leaves sessile, sinuate-lobed with prickly teeth, blotched with white; petals white or pale yellow.

MEXICAN ARGEMONE. Prickly Poppy.

Annual or biennial. Stem about 2 feet high, branching. Leaves 3-5 inches long. Sepals hooded at the apex and terminated by a stout spine.

Gardens and waste places. Naturalized from tropical America. June-October.

Obs. This is but sparingly naturalized in the Northern States, though it is a common weed at the South. It is sometimes cultivated in gardens, and should not be allowed to escape, as it has a strong propensity to travel; having made its way from tropical America to Asia, Africa, and the South Sea Islands.



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3. CHELIDO'NIUM, L. CELANDINE.

[Greek, *Chelidon*, a swallow; its flowers appearing with that bird.]

Sepals 2. Petals 4. Stigma 2-lobed, subsessile. Pod linear, smooth, 1-celled, opening from the base by 2 valves. Seeds conspicuously crested. Perennial herbs with brittle stems, an acrid yellow juice, small yellow flowers and divided leaves.

1. *C. Ma'jus*, L. Leaves twice pinnatifid, glaucous; flowers in umbel-like clusters.

GREATER CHELIDONIUM. Celandine.

Stem about 2 feet high, branched. Leaves 3-5 inches long. Pods about an inch in length, torulose.

Fence rows and waste places. Native of Europe. May-August.

Obs. A common weed about dwellings. Its very brittle stems, when broken, exude a saffron-colored strong-smelling juice, which is very bitter and acrid. The plant was at one time much extolled as a remedy for jaundice, but little use is made of it, except that the fresh juice is occasionally applied to warts.



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FIG. 19. A capsule of the Prickly Poppy (*Argemone Mexicana*), opening by valves at the top. 20. Celandine (*Chelidonium majus*), summit of a flowering branch.

4. SANGUINA'RIA, L. BLOODROOT.

[Latin, *Sanguis*, blood ; in reference to the red color of its juice.]

Sepals 2. *Petals* 8-12, spatulate oblong, the inner narrower. *Stigmas* 2-grooved, subsessile. *Capsule* oblong, ventricose, tapering at each end, 2-valved. *Seeds* strongly crested. *Perennial* herbs with thick *rootstocks* containing an orange-red acrid juice ; *flowers* on scapes.

1. *S. Canaden'sis*, L. Leaf mostly solitary, cordate reniform, long petioled ; flowers white, solitary on naked scapes.

CANADIAN SANGUINARIA. Bloodroot. Puccoon.

Rootstock thickish, fleshy, reddish-brown, about 2 inches long. *Leaf* about three inches long and wider than long ; *petiole* erect, finally 6-10 inches in length. *Scape* 4-8 inches high.

Rich woods ; common. April-May.

Obs. This is one of our earliest and most beautiful spring flowers. The flower, which is large for the size of the plant, is carefully protected by the leaf which envelopes it before expansion. Late in the season the leaves increase so much in size, and are so altered in appearance, that they but little resemble their early state. The plant does well in cultivation. An orange-colored juice is found in all parts of the plant, but is most abundant in the rootstock, which, under the name of Bloodroot, is used in medicine ; it is an emetic, and is also used for coughs, &c. ; in large doses it is poisonous. In some parts of the country the leaves are given to horses to promote the shedding of their hair, and the roots are given to destroy bots. *

ORDER VI. CRUCIF'ERAE. (MUSTARD FAMILY.)

Herbs with a pungent, watery juice, *leaves* alternate without stipules, and *flowers* in racemes or corymbs ; the pedicels without bracts. *Calyx* of 4 sepals, deciduous. *Corolla* of 4 regular unguiculate petals, their spreading limbs forming a cross. *Stamens* 6, 2 of them shorter (*tetradynamous*). *Fruit* a pod (called a *Silique* when much longer than broad, and a *Silicle* when short), which is 2-celled by a membranaceous partition that connects the two marginal placentæ, from which the two valves usually fall away. *Seeds* without albumen. *Embryo* curved ; *cotyledons* flat or plicate, either with their *edges* to the radicle or with the back of one of them to the radicle.

This order is a remarkably natural or homogeneous one, as well in the sensible properties as in the botanical characters of the plants belonging to it. The flowers so nearly resemble one another throughout the family, that the characters for genera are taken from the pods and seeds. There are but few important ones, however, besides those here noticed. The *Woad*, or Dyer's weed (*Isatis tinctoria*, L.) is cultivated in Europe for its blue coloring matter, but I believe it is little known or attended to in the United States.

1. Pod separating into two valves when ripe.

Pod usually many times longer than wide (silique.)

Pod not beaked. Seeds flat or oblong.

Pod varying from oblong-linear to ovoid, nearly terete ; valves nerveless. Flowers white or yellow.

1. NASTURTIUM.

Pod obtusely 4-angled ; valves 1-nerved. Flower yellow.

2. BARBAREA.

Pod awl-shaped, pressed close to the stem. Flowers small, pale yellow.

3. SISYMERIUM.

- Pod terminating in a strong beak. Seeds round. *Flowers yellow.
- Calyx erect in blossom. 4. BRASSICA.
- Calyx spreading in blossom. 5. SINAPIS.
- Pod short, not many times longer than wide (silicle or pouch).
- Pod globose (rarely forming). Flowers white. Leaves mostly undivided. 6. ARMORACIA.
- Pod pear-shaped, many-seeded. Flowers yellow. 7. CAMELINA.
- Pod flattened contrary to the narrow partition.
- Pod triangular obovate. Seeds many. 8. CAPSELLA.
- Pod roundish, small. Seeds 2. 9. LEPIDIUM.
- § 2. Pod not separating into valves but breaking up into joints when ripe.
- Flowers yellow or purplish. 10. RAPHANUS.

1. NASTURTIUM, *R. Br.* WATER-CRESS.

[Latin, *Nasus tortus*, a tortured nose, from the pungent effect of the plant.]

Silique, nearly terete, sometimes almost as short as a silicle, usually curved upwards; valves nerveless. *Seeds* small, irregularly disposed in a double series, not margined. Aquatic or subaquatic *herbs*. *Leaves* often pinnately dissected.

1. *N. officinale*, *R. Br.* Leaves pinnately divided; segments rounded or oblong; petals white, twice the length of the calyx.

OFFICINAL NASTURTIUM. Water-cress.

Fr. Cresson de Fontaine. *Germ.* Die Brunnenkresse. *Span.* Bérro.

Perennial. Stem 6–12 and 18 inches long, branching. Leaves odd-pinnately dissected segments in 3–4 pairs, the terminal one largest. Petals white.

Brooks and rivulets; probably introduced from Europe. *Fl.* June. *Fr.* July.

Obs. This plant (well known as the “Water Cress” in England,) is frequently cultivated, and is naturalized in some places. It affords an excellent and wholesome salad, antiscorbutic in its properties, as all the *Cruciferae* are, and being easily propagated, is worthy of being introduced into all suitable localities.

2. BARBAREA, *R. Br.* WINTER-CRESS.

[So named from having been formerly dedicated to *St. Barbara*.]

Silique linear, somewhat 4-sided, the valves keeled by a mid-nerve. *Seeds* in a single series. *Leaves* lyrate pinnatifid.

1. *B. PRÆCOX*, *R. Br.* Lower leaves lyrate, the terminal lobe obovate, or rounded, coarsely sinuate-dentate; upper leaves pinnatifid, with entire linear-oblong segments; siliques linear, elongated, scarcely thicker than their pedicels.

EARLY BARBAREA. Scurvy-grass. Early Winter-cress.

Fr. Roquette des Jardins. *Germ.* Die Winter-kresse. *Span.* Yerba de Santa Barbara.

Root biennial? *Stem* 9–15 inches high, somewhat branching. *Leaves* smooth; lower ones 3–4 inches long. *Petals* yellow. *Siliques* 2–3 inches long, slender.

Gardens; cultivated. *Fl.* May–June. *Fr.* July–Aug.

Obs. This plant, a native of Canada, and the country further north, is cultivated in the gardens, near Philadelphia, under the name of "Scurvy-Grass," and is becoming spontaneous farther south. The leaves afford a tolerable salad, but not equal to the common cress (*Lepidium sativum*, L.) nor to the Water-cress (*Nasturtium officinale*, R. Br.) There is another and stouter species (*B. vulgaris*, R. Br., probably naturalized), growing along our streams, which is sometimes used as a salad, but it is bitterish and inferior in quality to this.

3. SISYM'BRIUM, L. HEDGE-MUSTARD.

[An ancient Greek name, applied to this genus.]

Silique somewhat terete; 4-6 sided; valves 1-3-nerved. Seeds oblong, marginless. Annual or perennial *herbs*. *Leaves* various.

1. *S. officina'le*, Scop. Lower leaves runcinate, upper ones somewhat hastate; racemes slender and virgate; siliques erect, awl-shaped, close pressed to the stem.

OFFICINAL SISYMBRIUM. Hedge-mustard.

Fr. Herbe au Chantre. *Germ.* Der Hederich. *Span.* Jaramágo.

Root annual. *Stem* 1-3 or 4 feet high, with spreading branches. *Leaves* pilose; lower ones 3-6 or 8 inches long. *Petals* small, greenish yellow. *Siliques* terete-subulate or somewhat nerved and angular, tapering at apex.

Cultivated grounds, lanes and road-sides: introduced. Native of Europe. *Fl.* May-Aug. *Fr.* Aug.-Oct.

Obs. This foreigner is completely naturalized, and somewhat troublesome as a weed. It was formerly held in some repute, in Europe, as a remedy for coughs, the hoarseness of singers, &c. (whence its *French* name); but its virtues were doubtless overrated, and it is now regarded by tidy farmers in this country merely as a plant to be expelled from their premises.

4. BRAS'SICA, L. CABBAGE. TURNIP.

[Supposed to be from *Bresic*, the Celtic name for the Cabbage.]

Calyx erect. *Silique* sub-terete; valves concave, or slightly keeled by a central nerve. *Seeds* in a single series, globose. Foreign plants: mostly biennial *herbs*, with a short stem and long flowering branches.

1. *B. olera'cea*, L. Leaves somewhat fleshy, orbicular or oblong, strongly veined, repand or lobed, glabrous and glaucous.

OLERACEOUS OR POT-HERB BRASSICA. Cabbage.

Fr. Chou potager. *Germ.* Der Kohl. *Span.* Berza.

The following *Sub-species* or *Varieties* are more or less cultivated in the kitchen garden.

**Racemes paniculate.*

Sub-species ACEPH'ALA. Stem elongated; leaves expanded, not forming a head.

'Tree Cabbage. Bore-Cole. Headless Cabbage.

Sub-species, BULLA'TA. Stem somewhat elongated; young leaves subcapitate, finally expanding, bullate or crisped.

Savoy Cabbage. Curled Cabbage.

Sub-species CAPITA'TA. Stem short; leaves concave, not bullate, densely imbricated in a head before flowering.

Head Cabbage. York Cabbage.

Sub-species CAULO RA'PA. Stem with an oval or subglobose fleshy enlargement at the origin of the leaves.

Bulb-stalked Cabbage. Kohl Rabi.

***Racemes corymbose.*

Sub-species BOTRY'TIS. Leaves oblong, connivent, peduncles short, fleshy and coalesced in a head before flowering; flowers often abortive.

Var. a. CAULIFLO'RA. Stem short; heads thick, compact.

Cauliflower.

Var. b. ASPARAGOIDES. Stem taller; leaves elongated; heads somewhat branched; branches fleshy at apex, bearing clusters of abortive flower buds.

Broccoli.

Biennial. Stem 6 inches to 1-2 feet high, branching the second year from the summit, or head of imbricated leaves. Leaves large (6-12 or 18 inches in length); suborbicular or oblong. Racemes long, loose. Petals greenish or citron yellow.

Gardens and lots: cultivated. Fl. May-June. Fr. July.

Obs. The forms above enumerated, although known by distinct popular names and in their cultivated state widely different in appearance, are all believed to be varieties of *BRASSICA OLERACEA*, L., a native of the British Isles and the shores of northern Europe. They strikingly illustrate the changes which are produced in species by cultivation and the permanence of some varieties and races. They also give us instructive lessons in the economy of vegetable life. In the several kinds known as cabbage (a name derived from the Latin *caput*, a head, through the French *Cabus*), the first year is passed in producing foliage and in accumulating in the thick leaves and stem a supply of nutriment for the growth of the plant the following year. If it is allowed to make its second year's growth, branches are thrown up which develop with great rapidity, and produce an abundance of flowers and fruit. This growth takes place mainly at the expense of the material contained in the leaves and stem, and we find that the large leaves are soon exhausted of their nourishment and decay, and that the stem, which was before solid and

heavy, becomes light and spongy. Frequently the stems or stumps, from which the heads have been removed, are set out in gardens for the purpose of procuring a crop of sprouts or "greens." These are lateral branches, developed from axillary buds, and they will be found to start from just above the scars left by the fallen outer leaves. In the Kohl Rabi, the stem is the principal place of deposit of nutriment, and becomes consequently the eatable portion. In the cauliflower we eat the fleshy flower stalks and undeveloped buds, which are crowded together in a compact mass; it is the same also in the Broccoli, where the parts are more developed. *

2. *B. CAMPES'TRIS*, L. Leaves slightly fleshy, glaucous; the young lower leaves lyrate, dentate, somewhat hispid or ciliate; those above amplexicaul and acuminate.

FIELD BRASSICA. Turnip. Rutabaga, &c.

Biennial or annual. Root thick, turnip-shaped, depressed or orbicular, fleshy. Stem 1-4 feet high, branched above. Racemes loose. Petals yellow. Gardens and lots; cultivated. Fl. June. Fr. July-August.

The following are the principal varieties found in cultivation:

Sub-species NAPO-BRAS'SICA. Root tumid, turnip-shaped.

Var. a. COMMUNIS. Root white or purplish, with the summit and petioles greenish or purplish.

Turnip-rooted Cabbage.

Var. b. RUTABAGA. Root yellowish, subglobose.

Rutabaga. Swedish Turnip.

Sub-species RA'PA. Root depressed-globose abruptly contracted beneath. Common Turnip.

Obs. The Turnip has, like the Cabbage, by long cultivation, produced a number of marked varieties; these were formerly considered to belong to different species, but the best authorities regard them all as forms of *B. CAMPES'TRIS*, L., which is found growing spontaneously from the Baltic to the Caucasus. Besides those above enumerated as valuable for their roots, another variety (*var. OLEIFERA*) is largely cultivated in France and other parts of Europe, for the sake of the oil, which its seeds afford; this, under the name of Colza oil, is used for burning in lamps, the manufacture of soaps and other purposes. As this oil is imported into this country to a considerable extent, it might be advisable for farmers to ascertain if it cannot be profitably produced on our own soil. The various kinds of Turnips are largely cultivated in the temperate portions of Europe as food for stock, but the farmers of the United States having the advantage of the Indian Corn crop, do not much incline to the *Root culture*; perhaps not so much as might be beneficial to Stock during our long winters. *

6. SINA'PIS, *Tournef.* MUSTARD.

[A name of uncertain meaning ; derived from the Greek.]

Calyx spreading. *Silique* sub-terete, with a short beak (which is either empty or 1-seeded) ; valves nerved. *Seeds* in a single series, subglobose. Annual or biennial *herbs*—nearly allied to *Brassica*. *Lower leaves* usually lyrate, incised or pinnatifid. *Flowers* in elongated racemes.

1. *S. ni'gra*, *L.* Lower leaves lyrate and scabrous ; upper ones narrow and entire ; siliques somewhat 4-angled, smooth, appressed to the stem. **BLACK SINAPIS.** Mustard. Black Mustard.

Fr. Moutarde noire. *Germ.* Schwarzer Senf. *Span.* Mostazo.

Root annual. *Stem* 3-6 feet high, much branched, smooth. *Leaves* petiolate. *Racemes* slender. *Petals* greenish yellow. *Seeds* numerous, small, dark brown.

Gardens and waste places : introduced from Europe. Cultivated in some districts. *Fl.* June-July. *Fr.* August.

2. *S. al'ba*, *L.* Leaves all pinnatifid ; siliques hispid, spreading, scarcely as long as the sword-shaped 1-seeded beak.

WHITE SINAPIS. White Mustard.

Fr. Moutarde blanche. *Germ.* Weisser Senf. *Span.* Mostazo blanco.

Root annual. *Stem* 2-5 feet high, rather stout, branched. *Leaves* petiolate, lyrate-pinnate, the terminal segment large and 3-lobed. *Petals* rather large, yellow. *Seeds* few, larger than in the preceding species, pale brown.

Gardens : cultivated. Native of Europe. *Fl.* June. *Fr.* August.

Obs. These two species, known as Black and White Mustard, from the color of the seeds, are naturalized in many places, having escaped from gardens, where they are cultivated for their foliage, which is used as "greens," but especially for their seeds. The condiment known as Mustard or Flour of Mustard is prepared by grinding the seeds and sifting out the husks, both the white and black being used indiscriminately ; the powder from the latter is the most pungent, but the other affords the handsomest product. The skin of the White Mustard seeds contains a large amount of mucilaginous matter which is dissolved out by boiling water. The seeds are sometimes administered whole as a remedy in dyspepsia, &c. It is worthy of remark, that the pungency of mustard is only developed when mixed with water : if the dry seeds are expressed they yield a mild oil which has scarcely any taste of mustard. A small quantity of sulphur is contained in Mustard, and in Turnips also ; it is this which causes the blackening of a silver spoon when used in serving either of these articles. *

3. *S. arven'sis*, *L.* Pods smooth, knotty, about twice the length of the conical 2-edged usually empty beak ; upper leaves merely toothed.

FIELD SINAPIS. Wild Mustard. Charlock.

Annual. *Stem* 2-3 feet high, diffusely branched and somewhat rough with short retrorse hairs. *Lower leaves* large, 6 inches or more in length, lyrate pinnatifid. *Flowers* bright yellow about the size of those of the common turnip. *Pod* about an inch long and pointed with the stout beak.

Fields New York and westward. Native of Europe. June-August.

Obs. This is an exceedingly troublesome weed in Europe, and is becoming so in some portions of this country. It infests those grounds which are best suited to grain-culture; as the seeds retain their vitality for a long time it is very difficult to eradicate it when once established.



In this, as in other cases, the plant should be destroyed before the seed is formed; as sheep are fond of the herbage they are sometimes turned into a field to destroy the crop of Charlock. *

6. ARMORACIA, Rupp. HORSE RADISH.

[Name from one of the Greek names for Radish.]

Pod (pouch) elliptical or globose; the valves turgid, not nerved. *Petals* white, much longer than the calyx. *Seeds* numerous. *Leaves* undivided or the lower ones pinnatifid.

1. *A. rustica*na, Rupp. Radical leaves on long petioles, oblong, crenate, rarely pinnatifid; those of the stem lanceolate.

RUSTIC ARMORACIA. Horseradish.

Fr. Montarde des Capucins. *Germ.* Der Meer-Rettig. *Span.* Rábano.

Root perennial, long, terete, fleshy white, very acrid. *Stem* 2-3 feet high, angular-striate, smooth, with erect axillary branches. *Radical leaves* large (8-15 inches long—somewhat resembling those of a Dock, or Rumex); *petioles* 4-12 inches long. *Racemes* corymbose, elongating. *Petals* white. *Silicles* oval, usually abortive.

Gardens: margins of ditches, &c.: introduced. *Native* of Europe. *Fl.* May-June. *Fr.* June-July.

FIG. 21. Field Mustard (*Sinapis arvensis*), illustrating the general appearance of flowers in this family. 22. An enlarged flower opened to show the unequal stamens. 23. A pod.

Obs. The pungent *root* of this plant is a favorite condiment,—and one of the most valuable antiscorbutics. It requires little or no culture; but thrives best in a moist, rich, deep soil.

7. CAMELI'NA, *Crantz.* FALSE FLAX.

[Greek, *Chamai*, dwarf, and *Linon*, flax; from a fancied resemblance.]

Pod (pouch) obovoid or pear-shaped, pointed, turgid; valves 1-nerved; cells many-seeded.



1. *C. sati'va*, *Crantz.* Leaves sessile, oblong-lanceolate, nearly entire, sagittate at base; silicles margined, mucronate with the longish sub-conical style.

FIG. 24. False Flax (*Camelina sativa*), upper portion of a branch in fruit. 25. An enlarged capsule.

CULTIVATED CAMELINA. Wild Flax. Gold of Pleasure.

Fr. Cameline cultivée. Germ. Der Leindötter. Span. Miagro.

Root annual, fusiform, rather slender. Stem 18 inches to 2 or three feet high, simple, paniculately branching at summit, roughish-pubescent below, smoothish above. Leaves 1-3 or 4 inches long; the lower ones longest and often somewhat spatulate or oblanceolate; those above gradually smaller and smoother, sagittate with acute subamplexicaul lobes at base; pubescence of the lower leaves and stem often branched or bifurcate. Racemes corymbose-paniculate, elongating; pedicels half an inch to an inch long, without bracts. Petals pale yellow, rather small, cuneate or obovate-oblong, obtuse. Silicles about one-fourth of an inch long, with a keel-like margin on each side; style about half as long as the silicle, persistent, finally splitting with the dehiscent valves. Seeds reddish yellow.

Cultivated fields: among wheat, flax, &c.: introduced. Native of Europe. Fl. May-June. Fr. July

Obs. This was introduced with Flax, and remains as a weed where the culture of that plant has been abandoned. It was formerly a popular notion that the plant was a kind of transmuted or degenerate Flax, and is spoken of by the older writers as *Pseudo Linum* (False Flax). Such errors as this and the one that Wheat degenerates into Chess would no longer hold a place among agriculturists, did they but properly inform themselves concerning the objects among which their lives are passed.

8. CAPSEL'LA, Vent. SHEPHERD'S PURSE.

[Diminutive of the Latin, *Capsula*, a capsule; in allusion to the fruit.]

Pod (pouch) inversely triangular-heart-shaped; valves boat-shaped, coriaceous, not winged; cells many-seeded. Flowers small, in elongating racemes.

1. *C. Bursa-pastoris*, Moench. Radical leaves mostly pinnatifid; stem-leaves lanceolate, arrow-shaped, sessile.

SHEPHERD'S PURSE CAPSELLA. Shepherd's Purse. [Pastor.

Fr. Bourse de Pasteur. Germ. Die Hirten-tasche. Span. Bolsa de

Root annual. Stem 3 or 4-18 inches high, more or less hirsute, and often branched. Radical leaves 2 or 3-6 or 8 inches long. Racemes at first corymbose, finally elongated. Petals white.

Fields and road-sides: introduced. Native of Europe. Fl. April-September. Fr. June-October.

Obs. This worthless little intruder is found in almost every field; and is sometimes so abundant as to be rather a nuisance. Such small weeds, however, can generally be suppressed by careful culture, and inducing a vigorous growth of more useful plants.

9. LEPID'IUM, R. Br. PEPPERGRASS.

Pod (pouch) roundish, flattened contrary to the narrow partition, usually notched at the apex; the valves boat-shaped and keeled. Seeds 1 in each cell. Flowers small, white. Stamens often only 2.

1. *L. SATI'VUM*, *L.* Leaves oblong, variously incised and pinnatifid; silicles elliptic-ovate, winged and notched at apex.

CULTIVATED LEPIDIUM. Pepper-grass. Tongue-grass.

Fr. Cresson Alénois. *Germ.* Die Garten-Kresse. *Span.* Lepidio.



FIG. 26. Shepherd's Purse (*Capsella Bursa-pastoris*). 27. An enlarged pod (silicle or pouch) with one of the valves removed.

Root annual. *Stem* 9–18 inches high, smooth, glaucous, corymbosely branched above. *Leaves* 1–3 inches long, deeply divided into linear or cuneate segments. *Petals* white. *Seeds* compressed.

Gardens : cultivated. Native of Persia. *Fl.* June–July. *Fr.* August.

Obs. A pleasant antiscorbutic Cress, frequent in Gardens.

2. *L. Virginicum*, L. Pods orbicular, wingless, notched at the apex ; upper leaves linear lanceolate, toothed ; stamens 2.

VIRGINIAN LEPIDIUM. Wild Pepper-grass.

Annual. *Stem* a foot or more high, paniculately branched above, minutely pubescent. *Flowers* especially late in the season, minute. *Pods* on spreading pedicels.

Common. June–September.

Obs. This common weed is a native of the southern portion of our country, and is abundantly naturalized in many parts of Europe—thus making a partial return for the abundant supply of weeds which has crossed the ocean to our shores. It is very frequent in dry fields and along road-sides. The reddish-brown seeds are sometimes found among clover seed, and excite apprehension of some pernicious intruder ; but although a worthless little weed, if there be nothing worse among clover seed, the farmer need not be alarmed. *L. rudérale*, L., with oval and smaller pods and no petals, and *L. campestre*, L., with winged pods roughened with minute scales, are European species which are as yet but sparingly naturalized.

10. RAPHA'NUS, L. RADISH.

[Greek, *Ra*, quickly, and *phaino*, to appear from its quick germination.]

Pod elongated, 2–many-celled by corky transverse partitions. *Style* long. *Seeds* in a single series, globose. *Annuals* or *biennials*, with yellowish, whitish or purple flowers.



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1. *R. sativus*, L. Lower leaves lyrate, petiolate ; upper ones ovate-oblong, serrate, subhastate-lobed at base, subsessile ; petals purple and greenish white ; siliques terete, torulose, acuminate, scarcely longer than the pedicels, many-celled by corky false partitions.

CULTIVATED RAPHANUS. Radish. Garden Radish.

Fr. Radis. Raifort. *Germ.* Der Rettig. *Span.* Rábano.

The following varieties are usually cultivated :

FIG. 28. Cultivated Radish (*Raphanus sativus*), opened to exhibit the cellular partitions.

Sub-species RADICULA. Root more or less fleshy, tender, white or red.

Var. a. rotunda. Root subglobose. Turnip-radish.

Var. b. oblonga. Root oblong or fusiform. Common Radish.



Sub-species NIGER. Root fleshy, solid and firm, more or less acrid, black externally, white within.

FIG. 29. Wild Radish (*Raphanus Raphanistrum*), reduced.

Var. a. oblongus. Root oblong.

Var. b. rotundus. Root subglobose.

Black Turnip-radish. Spanish Radish.

Annual. Stem 1-3 feet high, sparsely hispid, branched. Leaves 8-12 or 15 inches long, hispid. Siliques with fungous or suberose partitions. Seeds few, large.

Gardens, &c. : cultivated. Native of China. Fl. June-September. Fr. July-October.

Obs. The tender fleshy root of this plant is an universal favorite at table, in early spring, and is found in every garden ; where, by successive planting, it may be produced all summer. To produce the root in perfection, a rich mellow soil and a wet season are requisite. It is somewhat spontaneous in some places, the seed having escaped from gardens.

2. *R. Raphanistrum*, L. Pod long-beaked, 2-jointed ; the lower joint often seedless and stalk-like ; the upper one necklace-form by constriction between the seeds, with no proper partition ; flowers yellow, turning white or purplish.

Wild Radish. Jointed Charlock.

Root annual, long and tapering. Lower leaves lyrate, the upper lobe large and rounded ; the upper leaves lanceolate, sinuate-dentate, all rough with bristly hairs.

Fields especially eastward. July-September.

Obs. Naturalized from Europe, and a troublesome weed in New England and New York State, and extending westward.

ORDER VII. HYPERICA'CEÆ. (ST. JOHN'S-WORT FAMILY.)

Herbs or shrubs, with a resinous juice. Leaves opposite, entire, without stipules, punctate with black or pellucid dots. Flowers regular. Calyx of 4-5 persistent sepals, the 2 outer ones often smaller. Petals 4-5, convolute in the bud, often sprinkled with black dots. Stamens usually numerous and united in 3 or more clusters. Capsule with septical dehiscence, many-seeded. Seeds destitute of albumen.

An order containing but few genera ; and those of little interest to the Agriculturist,—with the exception of the obnoxious species here noticed.

1. HYPER'ICUM, L. ST. JOHN'S-WORT.

[A name of obscure derivation and meaning.]

Sepals 5. *Petals* 5, oblique or unequal-sided. *Stamens* mostly numerous ; the filaments united at base in 3-5 parcels. *Styles* 3-5, persistent, sometimes united. *Capsule* membranaceous, 3-celled by the placentae meeting at the axis. *Herbaceous* or *shrubby*. *Flowers* cymose.

1. *H. perforatum*, L. Herbaceous ; stem somewhat two-edged ; leaves linear-elliptic, rather obtuse, sessile, pellucid punctate ; flowers in leafy paniculate corymbs ; petals and anthers with dark purple dots ; styles 3, long, diverging.

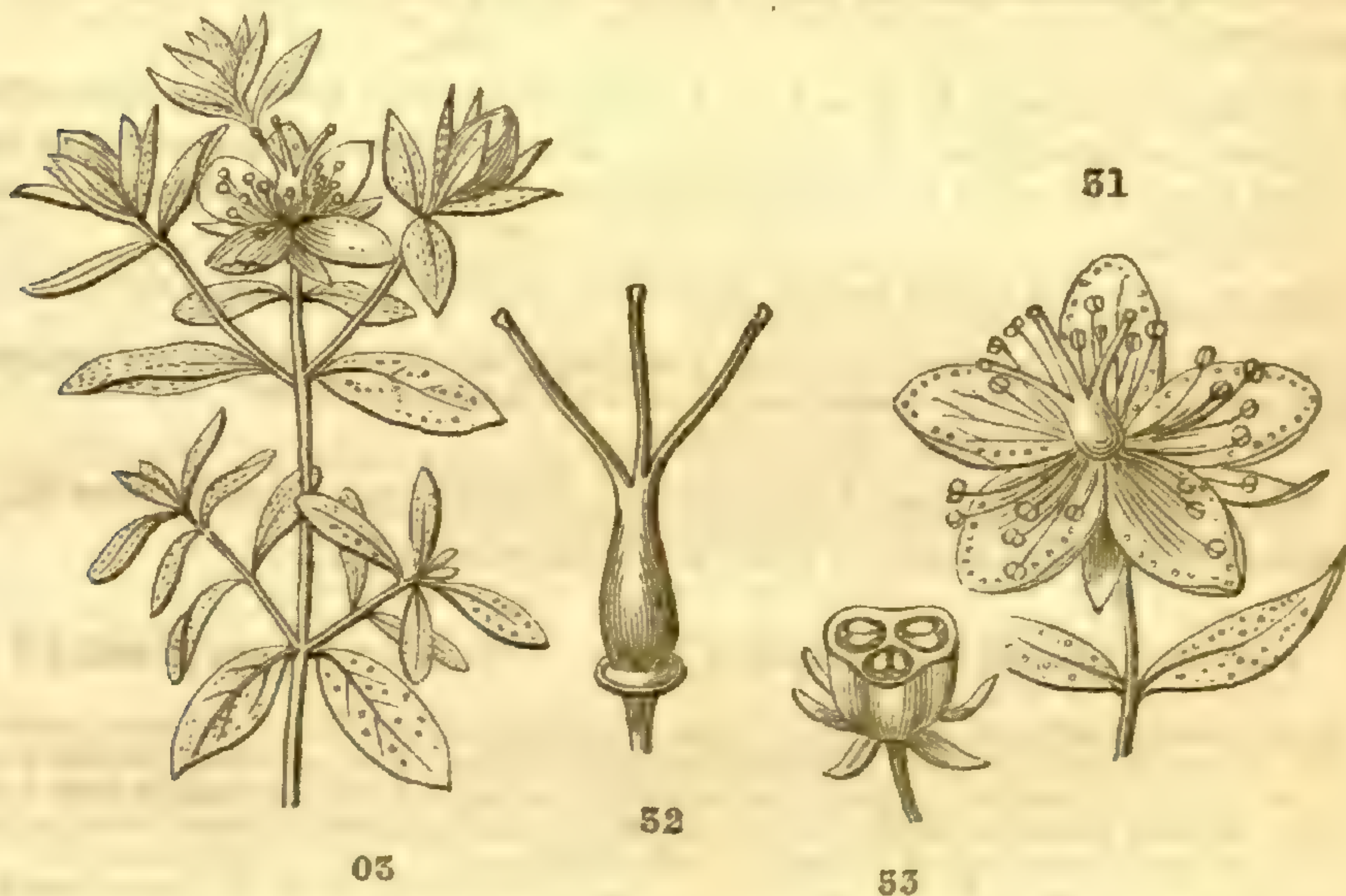
PERFORATED HYPERICUM. St. John's-wort.

Fr. Millepertuis. Germ. Das Johannes kraut. Span. Corazoncillo.

Root perennial. *Stem* herbaceous but finally hard, 1-2 feet high, often several from the same root, corymbosely branched. *Leaves* half an inch to an inch and a half long. *Petals* yellow or orange-colored.

Fields and pastures: introduced. Native of Europe. *Fl.* June-September. *Fr.* July-October.

Obs. This is a worthless and rather troublesome weed on our farms; and ought to be diligently excluded. Some 40 or 50 years ago, it was very common for cattle—especially *white* cows, and horses with *white* feet and noses—to be affected with cutaneous ulcers during the pasture season; and those sores were universally and confidently attributed to the *St. John's-wort*. In those days, I never doubted the fact, myself: but I must in candor add, that, although the plant continues to be



abundant in our pastures, I have not noticed any such sores for a number of years past. Was the affection ascribed to a wrong source? and has the real cause ceased to exist? The *flowers* and *leaves* are evidently somewhat resinous; and a *tincture* of them has held a place among popular remedies for disorders of the stomach and bowels. It is worthy of remark, that in the year 1842, the *St. John's-wort* totally failed to make its appearance (in Chester County—and I believe throughout Pennsylvania,) even in fields where it had previously abounded. The succeeding year it was quite rare; but it has since become as common as ever, in neglected fields. The *cause* of that total though temporary, disappearance of a perennial-rooted plant, is as obscure as the fact is curious.

FIG. 30. *St. John's-wort* (*Hypericum perforatum*), summit of a flowering branch. 31. An enlarged flower showing the clustered stamens. 32. A magnified pod. 33. The same divided crosswise.

This plant is called St. John's-wort, because it was supposed, in olden times, to have the power of keeping off evil spirits, which were supposed to be particularly busy on St. John's night. It is said that the custom is still followed, in the retired parts of the Pyrenees, of hanging garlands of the herb over the doors to preserve the inmates of the house from "storms, thunder, heretics, and other evil spirits."

ORDER VIII. CARYOPHYLLA'CEÆ. (PINK FAMILY.)

Herbs, with *stems* tumid at the nodes or joints, with opposite, often connate, entire *leaves*, usually without stipules, and mostly regular flowers. *Calyx* of 4-5 sepals, distinct or more or less cohering—often united into a tube. *Corolla* of 4-5 petals—or sometimes wanting. *Stamens* as many—or commonly twice as many—as the petals. *Styles*, or *stigmas*, 2-5. *Capsule* 2-5-valved—or opening only at apex by twice as many teeth or valve-points as stigmas. *Seeds* curved, mostly numerous: *embryo* coiled around the outside of mealy albumen

An Order, comprising about 30 genera, and a great number of species,—some of them (such as the *Pinks*) are very pretty and fragrant: but none of agricultural value.

The greater number of the representatives of the family growing wild, with us, are weeds which, with few exceptions, are not very troublesome, but as several are very frequent in cultivated lands and are likely to attract the notice of farmers, descriptions of the most common ones are given.

§ 1. PINK SUB-FAMILY. Sepals united into a tubular calyx. Petals 5, each with a long slender claw and with the stamens borne on the stalk of the ovary. Pod opening at the apex.

Calyx with leafy lobes, which are longer than the petals. Styles 5. 1. AGROSTEMMA.

Calyx without leafy lobes, cylindrical, even. Styles 2. 2. SAPONARIA.

§ 2. CHICKWEED SUB-FAMILY. Sepals distinct or nearly so. Petals (sometimes wanting) without claws, inserted with the stamens at the base of sessile ovary. Pod splitting into valves or opening by teeth, few-many-seeded.

Pod 3-celled, many-seeded. Petals none.

3. MOLLUGO.

Pod 1-celled. Styles 3-5.

Stipules none.

Styles 5. Petals 5. Pod opening by 10 teeth.

4. CERASTIUM.

Styles 3-4. Pod splitting into valves.

5. STELLARIA.

Leaves with scaly stipules.

Styles 5. Leaves thread-like, whorled.

6. SPERGULA.

1. AGROSTEM'MA, L. CORN-COCKLE.

[Name from the Greek, meaning crown of the field.]

Calyx tubular, without scales at the base, with 5 long leaf-like teeth which fall off in fruiting. *Petals* 5, not crowned at the throat. *Stamens* 10. *Styles* 5. *Pod* opening at the top by 5 teeth. Annual or biennial.

1. *A. Githa'go*, L. Hairy; leaves lance-linear, acute; petals obovate emarginate.

GITH-LIKE AGROSTEMMA. Corn-cockle. Rose-campion.

Fr. La Nielle des Blés. *Germ.* Gemeine Rade. *Span.* Neguillon.

Plant clothed with long appressed hairs. *Root* annual. *Stem* 2-4 feet high, branched above. *Leaves* 3-5 inches long. *Peduncles* terminal, 4-8 or 10 inches long. *Petals* reddish or pale violet-purple. *Capsule* ovoid. *Seeds* numerous, muricately ribbed, purplish-black.

Cultivated grounds—chiefly among wheat and rye: introduced. Native of Europe. *Fl* June *Fr.* July.

Obs. This foreign weed (specifically named Githago, from its fancied resemblance to "*Gith*," or Guinea Pepper), though diligently rooted out by all neat farmers, obstinately maintains its ground in our grain fields.



The rough black seeds, when abundant among wheat (and their size makes it difficult to separate them from it), are injurious to the quality and appearance of the manufactured flour.

FIG. 34. Corn-cockle (*Agrostemma Githago*), reduced. 35. A pod with the enclosing calyx divided lengthwise. a A seed.

2. SAPONA'RIA, L. SOAPWORT.

[Latin, *Sapo*, soap ; its mucilage affording a substitute for that article.]

Calyx tubular, 5-toothed, naked at the base. *Stamens* 10. *Styles* 2. *Capsule* short-stalked opening with 4 teeth at the apex. *Embryo* coiled into a ring.



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1. *S. officina'lis*, L. Leaves oval-lanceolate ; flowers in corymbose clusters ; petals crowned with an appendage at the top of the claw.

OFFICINAL SAPONARIA. Soapwort. Bouncing Bet.

Perennial. Stem 12-18 inches high. Leaves $1\frac{1}{2}$ -3 inches long. Flowers large, pale rose color, often double.

Waste places. Native of Europe. July-Sept.

Obs. A conspicuous weed, spreading by the root and forming large bunches near buildings and giving a slovenly appearance to the farm. The plant has been employed medicinally in Europe, as a substitute for Sarsaparilla in diseases of the skin. *

FIG. 36. Soapwort (*Saponaria officinalis*).

3. MOLLU'GO, L. CARPET-WEED.

[An old Latin name, coined from *mollis*, soft.]

Sepals 5, white within. *Petals* none. *Stamens* 3–5, hypogynous. *Stigmas* 3. *Pod* 3-celled, 3-valved, many-seeded. Diffusely branched prostrate *annuals*.

1. *M. verticilla'ta*, L. Prostrate and dichotomously branched; leaves spatulate, in whorls; peduncles axillary, 1-flowered, forming umbel-like clusters.

VERTICILLATE MOLLUGO. Carpet-weed. Indian Chickweed.

Stem branching in all directions, forming patches a foot or more in diameter. *Leaves* somewhat succulent, about an inch long, usually in whorls of 6.

Cultivated grounds, common. June–Sept.

Obs. A very common little weed in cultivated grounds, especially where the soil is sandy, throughout the country.

4. CERAS'TIUM, L. MOUSE-EAR CHICKWEED.

[Greek, *Keras*, a horn; from the shape of the capsules.]

Sepals 5. *Petals* 5, 2-lobed. *Stamens* 5–10. *Styles* as many as the sepals and opposite them. *Capsule* longer than the calyx, opening at the apex by 10 teeth and many-seeded. *Flowers* white.

1. *C. vulga'tum*, L. Very hairy; leaves ovate or obovate, obtuse; sepals longer than the pedicels; capsule slightly curved, twice as long as the calyx.

COMMON CERASTIUM. Mouse-ear Chickweed.

Annual or *biennial*. *Stems* 5–10 inches long. *Leaves* about half an inch long.

2. *C. visco'sum*, L. Pubescent and clammy, leaves oblong; sepals shorter than the pedicels; capsule one half longer than the calyx.

CLAMMY CERASTIUM. Larger Mouse-ear Chickweed.

Perennial or *biennial*. *Stems* 6–15 inches long, spreading. *Leaves* $\frac{1}{2}$ an inch to an inch long.

Obs. Common in pastures and on the borders of fields; both natives of Europe. In flower from May–July.

5. STELLA'RIA, L. CHICKWEED.

[Latin, *Stella*, a star; from the star-like flowers.]

Sepals 5. *Petals* 5, deeply 2-cleft. *Stamens* 10 or fewer. *Styles* 3–4. *Capsule* opening by twice as many valves as styles. *Flowers* white.

1. *S. me'dia*, Smith. Stems procumbent, with an alternating pubescent line; leaves ovate, the lower on hairy petioles; petals shorter than the calyx; stamens 3–10.

MIDDLE STELLARIA. Chickweed.

Annual or biennial. Stems 8-15 inches long, dichotomously branching. Leaves ½ an inch to an inch long. Peduncles axillary, 1-flowered. Common. Native of Europe.

Obs. This little plant, so common around dwellings, is found in almost every part of the world. It is exceedingly hardy, and may be found in flower even in the winter months; wherever the snow melts away the little star-like flowers appear. During the warmer months the flowers are much less conspicuous, the ovary being usually fertilized



without the flowers expanding. In damp cold soils it is sufficiently abundant to be troublesome, and sometimes occupies the soil to the exclusion of everything else. It is often given to canary and other cage birds. *

6. SPER'GULA, L. SPURREY.

[Name from the Latin, *Spargo*, to scatter.]

Sepals 5. Petals 5, entire. Stamens 5-10. Styles 5. Capsule 5-valved, valves opposite the sepals. Seeds orbicular with a narrow margin. Low herbs with narrow whorled leaves and minute stipules.

1. *S. arvensis*, L. Leaves linear and thread-like, many in a whorl;

FIG. 37. Chickweed (*Stellaria media*). 38. An enlarged flower. 39 A petal.

stipules minute ; inflorescence loosely cymose ; pedicels reflexed in fruit ; seeds rough.

FIELD SPERGULA. Corn Spurrey. Tares.

Annual. Stems about a foot long, erect or spreading. Leaves 1-2 inches long. Pedicels nearly an inch long, reflexed in fruit. Petals white, rather longer than the ovate sepals. Capsule about the size of a small pea. Seeds blackish.

Fields. Native of Europe. May-Oct.



Obs. This is only known as a weed with us. In some parts of Europe it is cultivated as a forage plant ; cattle are said to be very fond of it, and sheep thrive remarkably well upon it.

FIG. 40. Spurrey (*Spergula arvensis*)

ORDER IX. PORTULACA'CEÆ. (PURSLANE FAMILY.)

Succulent or fleshy *herbs*, with regular, unsymmetrical, axillary or terminal, usually ephemeral *flowers*. *Calyx* mostly of 2 sepals, often united below and adhering to the base of the ovary. *Petals* 5, or rarely more numerous. *Stamens* variable in number, opposite the petals when of the same number. *Styles* 2-8, united below. *Capsule* 1-celled; *placenta* central. *Seeds* mostly numerous, curved; *embryo* coiled around mealy albumen.

There are some 30 genera in the Order—of which the plant here noticed is the type. They are, however, of little or no interest to the farmer.

1. PORTULA'CA, *Tournef.* PURSLANE.

[A name of obscure and uncertain derivation.]

Sepals 2, partly united, and adherent to the base of the ovary,—the upper portion finally circumscissed and deciduous. *Petals* mostly 5, inserted on the calyx. *Stamens* 8-15 or 20. *Stigmas* 3-8. *Capsule* subglobose, circumscissed. *Leaves* scattered, often whorled near the flowers.



1. *P. oleracea*, L. Prostrate, smooth; leaves oblong-cuneate, obtuse, fleshy; flowers sessile, opening only in the morning sun.

POT-HERB PORTULACA. Purslane.

Fr. Pourpier potager. *Germ.* Gemeiner Portulak. *Span.* Verdolaga.

Root annual. *Stem* 6-12 or 15 inches long, fleshy, smooth, prostrate, branching and radicate. *Leaves* half an inch to an inch long, alternate and opposite. *Petals* pale yellow. Gardens and cultivated grounds. Native of Europe and India. *Fl.* July-August. *Fr.* September.

Obs. This plant, though said to be indigenous in the far west, has every appearance of being a naturalized stranger with us. It was often

FIG. 41. Purslane (*Portulaca oleracea*). 42. A pod, opening transversely.

used formerly, as a pot-herb ; but is now generally superseded by better ones,—and is, indeed, only entitled to notice, here, as a troublesome weed in gardens. *P. grandiflora*, *P. Gillesii* and others, having terete leaves, hairy axils and showy flowers are now common in gardens ; they are known in some places as “ Wax Pinks ;” they become quite permanently established where they are once introduced and will doubtless become weeds wherever they escape from cultivation.

ORDER X. MALVA'CEÆ. (MALLOW FAMILY.)

Herbs or shrubs, with alternate, palmately-veined *leaves* furnished with stipules. *Flowers* regular, mostly large, often with an involucl forming a double calyx. *Calyx* mostly of 5 sepals, more or less united at base. *Petals* as many as the sepals, convolute in the bud. *Stamens* monadelphous, often indefinite ; *anthers* reniform, 1-celled. *Styles* as many as the carpels, distinct or united below. *Fruit* capsular, or the carpels separate or separable. *Seeds* with little albumen ; *cotyledons* foliaceous, plicate and twisted. *Mucilaginous plants with a tough bark.*

An Order comprising about 30 genera, and numerous species—some of them showy and handsome. They are generally remarkable for their mucilaginous and demulcent properties : but the *Cotton plant* is preëminently interesting to the American people—both as yielding the great staple of the *exports* from the Southern States, and of the *manufactures* of the Northern States. There are, however, but few other plants of Agricultural importance belonging to the Order.

§ 1. Anthers at the top of the column of united filaments. Cells of the fruit united in a ring around a central axis from which they fall away when ripe.

Involucl present. Carpels 1-seeded.

Involucl 6–9-parted. Plant soft downy.

Involucl 3-leaved.

Involucl none. Carpels 1–several-seeded.

Seeds one in each cell.

Seeds 2–9 in each cell.

§ 2. Anthers along the sides of the upper part of the column of united filaments. Pod of 3–5 cells, splitting into as many valves.

Involucl of many thread-shaped leaves.

Calyx splitting down one side when the flower opens. Pod long.

Calyx not splitting down one side. Pod short. Seeds naked.

Involucl of 3 heart-shaped, toothed leaves. Seeds bearing long wool.

1. ALTHÆA.

2. MALVA.

3. SIDA.

4. ABUTILON.

5. ABELMOSCHUS.

6. HIBISCUS.

7. GOSSYPIMUM

1. ALTHÆ'A, L. MARSH-MALLOW.

[Greek, *Altho*, to heal ; from its reputed virtues.]

Involucl 6–9 cleft. *Fruit* depressed, consisting of numerous 1-seeded, round-kidney shaped, indehiscent *carpels*, arranged in a ring around a central axis.

1. *A. officina'lis*, L. Leaves ovate or somewhat heart-shaped, often 3-lobed, velvety ; peduncles axillary, many-flowered.

OFFICINAL ALTHÆA. Marsh-mallow.

Perennial. Root fusiform. Stem 2–4 feet high, erect. Leaves 2–4 inches long with petioles about half their length. Flowers pale rose color, sub-paniculate.

Cultivated, and spontaneous in salt marshes. July–September.

Obs. The Marsh-mallow is a native of Europe, and is sometimes

cultivated ; it has become naturalized along the coast of New England and Long Island. The whole plant, especially the root, contains a great deal of mucilage, and is employed by European physicians for poultices and such purposes as Slippery Elm bark is used with us. *ALTHÆA ROSEA* is the common Hollyhock of the gardens, many varieties of which are cultivated for ornament. *

2. MAL'VA, L. MALLOW.

[Latinized from the Greek, *Malache*, soft ; in allusion to its emollient nature.]

Involucel of 3 oblong or setaceous bracts. *Carpels* several, dry, indehiscent, arranged in a circle round the axis, as in *Althæa*.



1. *M. ROTUNDIFO'LIA*, L. Stem herbaceous, prostrate ; leaves cordate-orbicular, obscurely lobed, crenate-toothed ; pedicels axillary, 1-flowered, declined in fruit.

ROUND-LEAVED MALVA. Running Mallows. Low Mallows.

Fr. Petite Mauve. *Germ.* Rundblaettrige Malve. *Span.* Malva de hoja redonda.

Root perennial. *Stem* 1-2 or 3 feet long, branching only at base or from the root. *Leaves* 1-2 or 3 inches in diameter, obscurely 5-7-lobed ; *petioles* 2-6 or 8 inches long. *Flowers* small ; bracts linear. *Petals* twice as long as the calyx, reddish white with purple veins.

Yards, gardens and lots : introduced. Native of Europe. *Fl.* May-September. *Fr.* July-October.

FIG. 43. Common Mallow (*Malva rotundifolia*), a flower. 44. A leaf. 45. An enlarged flower with the petals removed to display the column of united stamens. 46. A ring of united carpels, forming the fruit and a separate carpel.

Obs. This foreigner is extensively naturalized; and although somewhat popular as an ingredient in cataplasms and demulcent drinks, is generally regarded as an unwelcome intruder in yards and gardens. *M. Sylvestris*, L., with an erect branching stem, 2–3 feet high and much larger flowers, is naturalized in Western New York. The Curled Mallow (*M. crispa*) is found in old gardens.

3. SI'DA, L. SIDA.

[The ancient Greek name.]

Involucel none. *Calyx* 5-cleft. *Petals* usually oblique. *Styles* 5 or more. *Fruit* when ripe separating into as many 1-seeded *carpels* as there are styles, which usually become 2-valved at the summit and at length separate from the axis. *Embryo* bent with the radicle pointing upwards.

1. *S. spino'sa*, L. Leaves ovate, lanceolate or oblong with a tubercle at the base of the petiole.

SPINOSE SIDA.

Annual. Stem 10–18 inches long, low and branched. Leaves about 2 inches long, serrate, petioled. Peduncles axillary, solitary, 1-flowered, shorter than the petioles, articulated near the yellow flower.

Road-sides and waste places; more common southward. Native of India. July–August.

4. ABU'TILON, Tournef. INDIAN-MALLOW.

[A name supposed to be derived from the Arabs.]

Carpels numerous, cohering and forming a compound capsule, spreading at the summit where each splits open along the inner edge, scarcely separating at maturity. *Seeds* 2–9 in each carpel.

1. *A. Avicennæ*, Gaertn. Leaves orbicular-cordate, acuminate, crenate-dentate, velvety-tomentose; peduncles axillary, shorter than the petiole.

AVICENNA'S ABUTILON. Indian-mallow. Velvet-leaf.

Root annual. *Stem* 2–4 or 5 feet high, branched. *Leaves* 4–6 or 8 inches long; *petioles* 3–5 inches long. *Petals* yellow. *Carpels* 12–15, verticillately arranged in a flattened, somewhat bell-shaped head.

Cultivated lots and waste places: introduced. Native of Europe and Asia. Fl. July–September. Fr. August–October.

Obs. This foreigner is a worthless and troublesome intruder—frequent in Indian-corn fields, Potato patches, and other cultivated lots—and is of a size sufficient to be a nuisance. It should be always carefully eradicated before it matures its seeds.



5. ABELMOS'CHUS, *Med.* OKRA.

[Name said to be derived from the Arabic, *Hub-ool-mooshk*.]

Calyx splitting down one side when the flower opens, deciduous. *Pod* elongated. Otherwise as in *Hibiscus*.

1. *A. ESCULEN'TUS*, *L.* Herbaceous; leaves somewhat obtusely and palmately 5-lobed, cordate at base, the lobes dentate; fruit 10-angled, pyramidal.

ESCULENT ABELMOSCHUS. Okra.

Root annual. *Stem* 18 inches to 3 feet high, somewhat branched, pilose but not aculeate. *Leaves* 3–6 inches long, and wider than long, lobed about half way to the base; *petioles* about as long as the leaves. *Petals* pale greenish yellow, with a dark purple spot at base. *Capsule* 2–3 inches long, erect.

Gardens: cultivated. Native of India. *Fl.* August. *Fr.* September–October.

Obs. This plant is cultivated for its green pods or capsules—which

FIG. 47. Velvet-leaf or Indian-mallow (*Abutilon Avicennae*), a branch reduced in size with fruit.

are remarkably mucilaginous, and much esteemed, by many persons, as a table vegetable, and as an ingredient in soups.

6. HIBIS'CUS, L. ROSE-MALLOW.

[An ancient classical name, for one of the Mallow Family.]

Calyx 5-cleft, persistent. *Involucel* of many linear bractlets. *Column* of stamens long, bearing *anthers* for much of its length. *Styles* united; *stigmas* 5, capitate. *Pod* 5-celled, opening into 5 valves which bear the partition on their middle. Herbs or shrubs with showy flowers.

1. *H. trio'num*, L. Upper leaves deeply 3-parted, lower ones toothed; calyx inflated, membranaceous, with bristly-ribs, 5-winged at the summit.

THREE-LOBED HIBISCUS. Bladder Ketmia. Flower-of-an-hour.

Annual. *Stem* 1–2 feet high, branched. *Leaves* 1–3 inches long, the lobes lanceolate, the middle one longest; *petioled*. *Flowers* greenish yellow with a purple spot at base, axillary, solitary, fugacious; *peduncles* about as long as the *petioles*. *Stigmas* 5.

Gardens and lots. Native of South Europe and Africa. July–September.

Obs. Formerly cultivated in gardens, and not rare as a weed in cultivated grounds.

2. *H. SYRI'ACUS*, L. Shrubby or tree-like; leaves ovate-wedge-shaped, smooth, entire at the base, 3-lobed and toothed at the apex; pedicels scarcely longer than the petioles; involucel 6–7-lobed.

SYRIAN HIBISCUS. Rose of Sharon. Shrubby Althæa.

Obs. Very common in cultivation, where it is usually kept trimmed; when allowed to grow uncut it forms a large tree-like shrub, with long straggling branches. The flowers are of various shades, from white to deep purple; often becoming double. It is rather troublesome in grounds on account of the readiness with which it propagates itself by the seeds. *

7. GOSSYP'IUM, L. COTTON.

[A name supposed to be of Egyptian origin; etymology obscure.]

Calyx cup-shaped, obtusely 5-toothed, surrounded by a 3-leaved involucel; the leaflets united and cordate at base, deeply incised-dentate. *Styles* united; *stigmas* 3 or sometimes 5. *Capsule* 3–5-celled, loculicidal. *Seeds* numerous, enveloped in a long fine wool. *Young branches* and *leaves* more or less covered with black dots; the nerves beneath usually with one or more glands.

1. *G. HERBA'CEUM*, L. Stem smooth; leaves 3–5-lobed, with a single gland beneath; lobes rounded, mucronate; involucel serrate; wool white.

HERBACEOUS GOSSYPIUM. Cotton. Cotton-plant.

Fr. Le Cottonnier. *Germ.* Die Baumwolle. *Span.* Algodon.

Root annual. *Stem* 2–4 feet high, branched. *Leaves* 3–5 or 6 inches long; *petioles* 2–3 inches long. *Petals* greenish yellow, tinged with purple at base. *Seeds* large, thickly beset with long wool-like cellular or tubular fibres, which, at maturity, are shrunk and contorted so as to render them in some degree adhesive, when pressed together,—and thereby susceptible of being spun or drawn and twisted into delicate threads.

Cultivated very largely in the Southern and South-western States. Native of Asia.

Obs. This plant—as yielding the material for light clothing, and especially in reference to its commercial value—may be regarded as one of the most important objects of American Agriculture. Although not so essential as the *cereal* tribe, the fibrous envelope of the seeds is scarcely less interesting, as an article of trade, and as the subject of useful and ingenious industry.

ORDER XL. TILIA'CEÆ. (LINDEN FAMILY.)

Trees or shrubs having the mucilaginous qualities and tough inner bark of the Mallow Family, alternate leaves with deciduous stipules and small axillary flowers. *Sepals* valvate in the bud, deciduous. *Petals* imbricated in the bud. *Stamens* usually in clusters; *anthers* 2-celled. *Seeds* albuminous.

The Lindens are the only representatives of this order in the United States. *Corchorus capsularis* of India furnishes the fibre from which the *Gunny-bags* of commerce are made.

1. TIL'IA, L. LINDEN.

[The classical Latin name.]

Sepal 5, connected at base. *Petals* 5. *Stamens* numerous, more or less cohering in 5 parcels, the central one of each parcel—in the North American species—cohering with the base of a petaloid scale, opposite to the real petals. *Ovary* 5-celled; cells with 2 ovules. *Fruit* coriaceous or woody, globose, by abortion 1-celled, 1 – 2-seeded. *Trees* with subcordate serrate leaves, and a tough, fibrous bark. *Flowers* in pendulous cymes, with the lower half of the common peduncle adnate to a long membranous-foiaceous bract.

1. T. EUROPE'A, L. Leaves orbicular-cordate, acuminate, puberulent beneath; flowers without petaloid scales.

EUROPEAN TILIA. Linden, or Lime tree. European Linden.

Fr. Le Tilleul. Germ. Die Linde. Span. Tilo.

Stem 20 – 40 or 50 feet high, and 1 – 2 feet in diameter, the numerous branches forming a handsome symmetrical top. *Leaves* 3 – 5 inches long; *petioles* 1 – 2 inches long. *Flowers* yellowish white.

Cultivated. Native of Europe. Fl. Beginning of June. Fr. Sept. – Oct.

Obs. This foreign species has been extensively introduced as an ornamental shade tree in our cities and villages. In the beginning of summer it is handsome, but the leaves begin to die or become diseased, assuming a scorched appearance, soon after midsummer; and the tree is, moreover, infested by so many loathsome and destructive insects, that it is now being superseded by others less subject to such accidents. The flowers are said to afford to bees a superior quality of honey.

2. T. America'na, L. Leaves obliquely heart-shaped, or truncate at base, abruptly acuminate, thickish, smooth, or nearly so; flowers with petaloid scales, connected with the filaments.

AMERICAN TILIA. Linden, or Linn. Basswood. Whitewood.

Stem 40 – 60 or 80 feet high, and 2 – 3 feet in diameter, with spreading branches. *Leaves*

3-6 inches long, unequal at base ; *petioles* 1-2 inches long. *Flowers* yellowish-white or cream colored.

Rich woodlands and banks of streams ; along the mountains, from Canada to Georgia. *Fl.* Latter end of June. *Fr.* Sept. - Oct.

Obs. A variety of this species (var. *pubescens*, Gray,) has the often thin leaves softly pubescent beneath. This form is common south and west, as well as the White Basswood (*T. Heteroph'ylla*, Vent.), which has very large leaves, sometimes 8 inches broad, silvery-white, with fine down beneath. The wood of all the Lindens, commonly known as Basswood, is light, soft and white, and is used for making boxes, bowls and other domestic utensils, for the panels of wagons, bottoms of drawers, &c. The inner bark, *bast* or *bass*, consists of long, tough fibres, and by soaking in water, readily separates into layers. That of the European species furnishes the matting, which forms an important item in the products of Russia. It is much used by gardeners for protecting tender plants from frost, and furnishes them the best material for tying up shrubs, and for binding up the wound made in the operation of budding. The gardeners of the Western States, it is said, obtain their supply of bast from our American species. *T. AMERICANA* is sometimes planted as a shade tree. Its branches are more spreading than those of the European species, and its whole appearance is less symmetrical, moreover, it is, like that, liable to be infested by insects. *

ORDER XII. MELIA'CEÆ. (BEAD-TREE FAMILY.)

Trees or *shrubs*, with alternate, usually compound *leaves* destitute of stipules. *Calyx* of 3-5 sepals more or less connected. *Petals* 3-5. *Stamens* twice as many as the petals, monadelphous, inserted outside of a hypogynous disk ; *anthers* sessile in the orifice of the tube of filaments. *Ovary* several-celled, with 1-2 ovules in each cell ; *styles* and *stigmas* mostly united into one. *Fruit* a drupe, berry, or capsule, often 1-celled by abortion, and the cell 1-seeded. *Seeds* with little or no albumen, and wingless.

The genus which represents this Order is the only one belonging to it which is much known in our country, and that is pretty much confined to the States south of the Potomac.

1. ME'LIA, L. PRIDE OF INDIA.

[The Greek name of a species of Ash, which this tree resembles.]

Calyx small, 5-cleft. *Petals* 5, linear-oblong, spreading. *Stamen-tube* 10-cleft at summit, with 10 anthers in the orifice ; segments of the tube 2-3-parted. *Ovary* seated on a slightly elevated disk ; *style* filiform ; *stigma* capitate, 5-angled. *Drupe* ovoid, with a 5-celled bony nut ; cells 1-seeded. *Embryo* inclosed in thin fleshy albumen ; cotyledons flat, foliaceous. *Trees* with odd-pinnate or bipinnate leaves. *Flowers* in axillary panicles.

1. *M. AZEDA'RACH*, L. Leaves bipinnate ; leaflets somewhat in fives, obliquely ovate-lanceolate, acuminate, incised-dentate, smooth.

Pride of India. Bead-tree.

Fr. *Arbre aux patenôtres.* *Germ.* Der Zederach.

Stem 20-40 feet high, and 1-2 or 3 feet in diameter, with branches clustered at irregular intervals. *Leaves* deciduous ; *leaflets* 1-2 or 3 inches long, forming secondary pin-

nae of 2-3 pairs, with a terminal odd one. *Flowers* pale violet-purple or lilac-colored. *Drupe* with a soft yellowish pulp, and an obtusely angular nut.

Cultivated. Native of Syria, Persia, and the far East. *Fl.* April. *Fr.* Sept.-Oct.

Obs. This tree has been introduced into the Southern States as an ornamental shade tree, and is now perfectly naturalized there and west to Arkansas. It will not endure the winters of Pennsylvania. The most northern point at which I have seen trees of any considerable size, was Norfolk, Virginia, and even there they are sometimes killed by frost. The bark of the root is reputed to be a good vermifuge. In the south of Europe, the nuts are often used for beads; whence one of its English and French names.

ORDER XIII. LINA'CEÆ. (FLAX FAMILY.)

Herbs with alternate or opposite *leaves*, without *stipules*, and regular hypogynous *flowers*, with all the parts in fives. *Calyx* imbricated and *petals* convolute in the bud. *Stamens* united at the base into a ring. *Capsule* globose, with twice as many 1-seeded cells as there are styles.

An order pretty much limited to the important genus which is its type.

1. LI'NUM, L. FLAX.

[The classical name for the plant.]

Capsule of 5 united carpels, each 2-seeded, but divided into 2 single-seeded cells by a false partition, projecting from the back of the carpels.

1. *L. USITATIS'SIMUM*, L. *Leaves* alternate, lance-linear, very acute; *flowers* on long pedicels; *capsules* globose, mucronate.

MOST USEFUL (OR COMMON) LINUM. Flax.

Fr. Lin. *Germ.* Gemeiner Flachs. *Span.* Lino.

Root annual. *Stem* 2-3 feet high, slender, terete, smooth, corymbosely branched at summit. *Leaves* an inch to an inch and a half long. *Petals* rather large, blue, often with a tinge of purple, very caducous. *Seeds* lance-ovate, smooth and shining.

Cultivated, and occasionally spontaneous in cultivated grounds. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This valuable plant—once considered so indispensable among the crops of our farmers—is now but little cultivated. I have not seen a flax-patch for a number of years: whereas, in the “good old times”—before *Spinning-wheels* were superseded by *Pianos*—every rural family cultivated and manufactured as much flax as was required for domestic purposes. But now, the Cotton-plant of the South has nearly banished the Flax-plant from the Middle and Northern States.

Nor is the revolution thus effected a subject of regret, with the farmer.



The flax crop is one which involves a good deal of troublesome, disagreeable labor, and, without being profitable, is generally believed to be injurious to the soil: an opinion as old as the time of *Virgil*—who says

“Urit enim *Lini* campum seges, urit avenæ.”—GEORG. 1. 71.

or, as rendered by *Sotheby*,

“Oats and the *Flaxen* harvest burn the ground.”

The seeds of this plant—besides yielding a most valuable drying oil, used in painting—afford one of the best mucilaginous drinks, for coughs, and dysenteric affections.

ORDER XIV. GERANIA'CEÆ. (GERANIUM FAMILY.)

Mostly *herbs* with symmetrical, hypogynous, pentamerous *flowers*. *Sepals* imbricated. *Petals* convolute. *Stamens* 10, slightly monadelphous at base, the alternate ones shorter. *Pistils* 5, adhering to a central prolonged axis, from which they separate at maturity by curling up and carrying with them the small 1-seeded pods. *Seeds* without albumen. *Herbs*, or sometimes shrubby plants with opposite or alternate, stipulate, scented *leaves* and astringent *roots*.

The ornamental half-shrubby plants so common in collections of green-house plants and usually called *Geraniums*, belong to the genus *PELARGONIUM*.

1. GERA'NIUM, L. CRANES-BILL.

[Greek, *Geranos*, a crane; the beaked fruit resembling a crane's bill.]

Stamens all perfect, the 5 longer ones with glands at base. *Styles* cohering at the summit, recurved from below, but not twisted, in the ripe fruit; smooth inside.

1. *G. macula'tum*, L. Stem erect, dichotomous above; leaves 3–5-parted; petals entire, twice as long as the calyx.

SPOTTED GERANIUM. Cranes-bill.

Perennial. Stem 12–18 inches high, hairy. *Leaves* 2–3 inches long, the divisions lobed and cut at the end, blotched with whitish as they grow old, the radical on petioles 3–6 or 8 inches in length, those of the stem on much shorter petioles and the upper ones subsessile. *Flowers* purple, large, somewhat corymbose. *Petals* bearded on the claw.

Woods and along fences, common. April–July.

Obs. This plant is not troublesome as a weed, but is introduced here on account of its valuable medicinal properties; it being one of the best astringents used in medicine—equalling in importance any of the imported articles of that class—the agriculturist ought to be able to identify it. The thick, fleshy root, or rather rhizoma, which should be collected in autumn, is powerfully astringent, without bitterness or unpleasant taste, and is useful in diarrhoea and other diseases where a medicine of this kind is required. Boiled in water and mixed with sugar and milk, it is easily administered to children. ***G. Carolinian'um*, L.**, a native species, and ***G. pusillum***, an introduced one, are annual species, and common in waste places. ***Erodium cicutarium*, L.**, (which has the 5 shorter stamens sterile, and the styles, in fruit, twisting spirally,) is naturalized sparingly in the Atlantic States, but in California and Oregon it has taken complete possession of large tracts; it is there known as “pin weed.”



ORDER XV. OXALIDA'CEÆ. (WOOD-SORREL FAMILY.)

Herbs with sour juice and alternate compound *leaves*. *Flowers* regular nearly as in *Geranium*—but the *styles* separate, and the *fruit* a 5-celled several-seeded capsule.

1. OX'ALIS, L. WOOD-SORREL.

[Greek, *oxys*, sharp or sour.]

Petals withering after expansion. *Capsule* membranaceous, deeply 5-lobed, 5-celled, each cell opening on the back. *Seeds* pendulous from the axis, their outer coat loose and separating. *Embryo* large and straight in a fleshy albumen. *Leaves* of 3 obcordate leaflets, which close and droop at nightfall,—the radical ones stipulate.

FIG. 49. Cranes-bill (*Geranium maculatum*), a flowering summit. 50. A ripe fruit enlarged, showing the carpels separating from the axis.

O. stric'ta, L. Caulescent; stem mostly erect, branched and leafy; peduncles axillary, longer than the petioles.

UPRIGHT OXALIS. Wood-sorrel. Yellow Wood-sorrel.

Perennial? Stem 3 inches to near 2 feet high, more or less pubescent, often bushy, and sometimes nearly prostrate. *Leaflets* one fourth of an inch to an inch long. *Peduncles* 2-5 inches long, with 2-10 yellow flowers.

Fields and cultivated grounds. May-September.

Obs. The leaves of this very common plant have an agreeable acidity, and are frequently eaten by children. Another species is cultivated, especially in Europe, as a culinary herb. The juice of the various species contains a salt (Binoxalate of Potash) which, under the name of Salts of Sorrel, was formerly much used for removing ink-stains and spots of iron-rust from linen. *

ORDER XVI. TROPÆOLA'CEÆ. (INDIAN-CRESS FAMILY.)

Herbs with a pungent, watery juice, a straggling or twining stem, alternate petiolate peltate or palmate leaves with radiating nerves, and without stipules. *Flowers* irregular, large on long axillary peduncles. *Fruit* 3-lobed, composed of 3 united carpels, which are 1-seeded, indehiscent, and separate from the common axis when mature. *Seeds* without albumen, large; *cotyledons* thick, distinct when young, finally consolidated or soldered together.

A very small Order, and of little interest beyond the genus which represents it.

1. TROPÆ'OLUM, L. NASTURTIIUM.

[Latin, a little banner, or *Trophy*; from a fancied similitude in the plant.]

Calyx colored, 5-parted; the upper segment spurred at the base. *Petals* 5, unequal; the upper two sessile, the others clawed. *Stamens* 8. *Stigmas* 2.

1. *T. MA'JUS*, L. Leaves peltate, sub-orbicular, obscurely repand-lobed, the nerves not exserted; petals obtuse.

GREATER TROPÆOLUM. Nasturtium. Indian-cress.

Fr. Grande Capucine. *Germ.* Die Kapuziner kresse. *Span.* Capuchina.

Root annual. *Stem* 3-6 or 8 feet long, fleshy, smooth. *Leaves* 2-3 inches in diameter, the nerves which radiate from the centre not projecting beyond the margin (as they do in another species); *petioles* 3-6 inches long. *Peduncles* 1-flowered, mostly longer than the petioles. *Petals* yellowish or reddish orange, with dark purple stripes and spots—the three lower ones fringed at base. *Carpels* sulcate, fleshy, finally suberose or coriaceous.

Gardens. Cultivated. Native of South America. *Fl.* June-September. *Fr.* August-October.

Obs. This ornamental stranger is sometimes cultivated for show; but chiefly for the young fruit—which is prepared as a condiment, and affords a tolerable substitute for capers. The plant is said to be perennial in its native country (Peru), whence it was brought to Europe in the year 1684.

ORDER XVII. RUTA'CEÆ. (RUE FAMILY.)

Herbs, shrubs or trees, with simple or compound leaves, punctate with pellucid dots containing a pungent, volatile oil (except in Ailanthus, a doubtful member of the Order,) and perfect, polygamous or dioecious, hypogynous, regular, 3-5-merous flowers. Stamens twice as many as the sepals; pistils 2-5 separate or combined into a compound ovary of as many cells, raised on a prolongation of the receptacle or fleshy disk; styles sometimes cohering when the ovaries are distinct.

1. RU'TA, L. RUE.

[Name of doubtful derivation.]

Flowers perfect. Sepals and petals 4 (rarely 3-5). Stamens twice as many as the sepals, with a gland at base. Style 1. Capsule roundish, lobed. Seeds albuminous. Herbs, sometimes suffruticose, with alternate leaves and yellow flowers.



1. *R. GRAVE'OLENS*, L. Leaves decomposed; lobes oblong, the terminal one obovate; petals entire or somewhat toothed.
HEAVY-SMELLING RUTA. Rue. Garden-rue.

Perennial. Stem bushy 2-3 feet high, woody at base, the branches smooth, yellowish green. *Leaves* dotted, glaucous or bluish green. *Flowers* in terminal corymbose panicles, pale greenish-yellow; the first one which unfolds has 5 sepals and petals, and 10 stamens, while the succeeding ones have only 8 stamens and 4 sepals and petals. *Pod* roundish, warty, 4-5-lobed. The stamens approach in turns towards the pistil, and after the anthers have shed their pollen, retire.

Native of Southern Europe. Cult. June - Sept.

Obs. The Garden-rue, as it is commonly called, probably to distinguish

FIG. 51. Rue (*Ruta graveolens*), a flowering branch. 52. A fruit of the same.

it from Meadow-rue, is frequently found in old gardens, where it is cultivated as a medicinal herb. The plant is very acrid, and when handled sometimes irritates or even blisters the skin, and to some persons it is highly poisonous. Its properties are stimulant and narcotic, and though sometimes used in domestic practice, in cholic, hysterics, &c., it is altogether too dangerous a plant to be employed unadvisedly. Its oil is a powerful poison. The plant was much used by the ancients, who ascribed wonderful virtues to it; they had the idea that stolen Rue flourished the best. At one time it was employed to sprinkle the holy water in the ceremonies of the Roman Catholic church, which is perhaps the reason of Ophelia's saying: "We may call it herb of grace, o' Sundays." *

2. ZANTHOX'YLUM, Colden. PRICKLY ASH.

[Greek, *Zanthos*, yellow, and *Xylon*, wood.]

Flowers dioecious. *Sepals* 5, or wanting in one species. *Petals* 4–5, imbricated. *Stamens* 4–5 in the sterile flowers, alternate with the petals. *Pistils* 2–5, separate, but their styles conniving or slightly united. *Pods* thick and fleshy, 2-valved when ripe, 1–2-seeded. *Seed-*



coat crustaceous, black, smooth and shining. *Embryo* straight, with broad cotyledons. *Shrubs* or *trees* with mostly pinnate *leaves*; the *stems* and often the *leaf-stalks* prickly. *Flowers* small, greenish or white.

1. Z. Americanum, Mill. Leaves and flowers in axillary clusters;

FIG. 53. Prickly Ash (*Zanthoxylum Americanum*), portion of a pistillate specimen in flower, the leaves not fully developed. 54. An enlarged staminate flower. 55. An enlarged pistillate flower.

leaflets in 4-5 pairs and an odd one; calyx none; petals 5; pistils 3-5; pod short stalked; flowers appearing with the leaves.

AMERICAN ZANTHOXYLUM. Northern Prickly Ash. Toothache Tree. Yellow Wood.

Shrub 4-8 feet high. *Stems* prickly, the stronger prickles mostly in pairs at the base of the leaves. *Leaflets* 1-2 inches long, downy when young, becoming smooth above when old. *Flowers* sometimes polygamous. *Pods* about the size of a pepper-corn, with a brown or reddish tinge, pitted, fragrant with a lemon like odor when rubbed. *Seed* solitary.

River banks and rocky woods, north and west. April-May.

Obs. In its wild state this shrub forms low thickets, but when cultivated and trimmed it forms a small tree sometimes 20 feet high. It has been proposed as a hedge plant, but we are not aware that any experiments have been made to test its value for this purpose. All parts of the plant are aromatic, and the bark is used in medicine; this when chewed has a sweetish aromatic taste which becomes bitter and acrid, causing a flow of saliva; it has been used for the tooth-ache, whence one of its popular names. An infusion is used in domestic medicine, in the treatment of rheumatism and in cholic, &c. *

2. *Z. Carolinianum*, Lam. Leaflets 3-5 pairs and an odd one, ovate lanceolate, inequilateral, shining above; flowers in terminal cymes, appearing after the leaves; sepals and petals 5; pistils 3; pods sessile; prickles very sharp.

CAROLINA ZANTHOXYLUM. Southern Prickly Ash.

Shrub or *small tree* 6-20 feet high and 6-10 inches in diameter. Grows in sandy soil along the sea coasts of the Southern States. Properties similar to the preceding.

3. AILANTHUS, Desf.

[From *Ailanto*, the name it bears in its native country.]

Calyx 5-toothed. *Petals* 5, inserted with the 10 *stamens* under a hypogynous disk. *Carpels* 3-5, samaroid, tumid in the centre, 1-celled, 1-seeded. *Stigmas* capitate, radiately 5-lobed. *Flowers* dioeciously polygamous.

1. *A. glandulosa*, Desf. Leaves odd-pinnate; leaflets oblong-lanceolate, acuminate, coarsely dentate at base, with a gland on the under side of each tooth.

GLANDULAR AILANTHUS. Chinese Sumach. Tree of Heaven. Tillow or Tallow Tree.

Stem 30-60 feet or more high, much branched, young branches never multiplying during growth but developed only from the buds of the preceding year. *Leaves* (on young trees especially) much elongated and consisting of many pairs (15-20) of smooth leaflets, which are 3-5 inches in length and entire, except a pair or two of coarse teeth at base. *Flowers* pale greenish yellow, in terminal open thyrsoid panicles.

Cultivated as a shade tree. Native of China. Fl. June. Fr. Sept.-Oct.

Obs. Perhaps no tree has been the subject of as much newspaper discussion as the Ailanthus, and there is much to be said for and against

its cultivation as a shade tree. It has in its favor a graceful habit, is cleanly and quite free from insects, gives a tolerable shade and is perfectly hardy, growing where almost any other would not survive. The objections to it are, the disagreeable odor it emits when in flower, and the readiness with which it multiplies itself by suckers and by seeds. The odor, which is really offensive in sultry weather, is emitted by the staminate flowers, but as the tree is not perfectly dicecious, the pistillate ones producing more or less staminate flowers, the difficulty could not be obviated by cutting down the sterile trees, there being no means of distinguishing them while young. In streets the rapid multiplication is not so much of an objection as where the tree is cultivated in open grounds, though even here the seed will germinate wherever it can come in contact with the earth. The young plants spring up between bricks and flag-stones, in areas and small grass plots, and even on window-caps and in crevices in the walls of buildings; and in parks the multitude of seedlings becomes an absolute nuisance. Still, notwithstanding all these disadvantages, there is no tree so generally employed in the city of New York as a shade tree, where it attracts the eye of the stranger by the tropical aspect of its foliage and the large massy bunches of ripening fruit, which are variously tinged with red or brownish. The tree has been recommended for cultivation on prairie lands and others where there is a scarcity of timber for fencing material. As far as rapidity of growth is concerned, it is certainly admirably adapted to this use, but it is not known whether the timber would be sufficiently durable. The wood, though brittle, is very hard and takes a good polish. *

ORDER XVIII. ANACARDIACEÆ. (CASHEW FAMILY.)

Trees or shrubs, with a resinous or milky, often acrid juice, which turns black in drying, alternate dotless *leaves* without *stipules* and small, often polygamous, regular pentandrous *flowers*. *Petals* imbricated in the bud. *Ovary* 1-celled (by abortion), but with 3 styles or stigmas, and a single ovule. *Fruit* indehiscent, usually drupaceous. *Seed* without albumen; *embryo* curved.

In the tropical regions, this Family presents plants of much interest: such as that which yields the celebrated Mango fruit (*Mangifera Indica*, L.)—the Casnew nut (*Anacardium occidentale*, L.) and the Pistacia nut (*Pistacia vera*, L.); with others which afford various kinds of Lacquer and Varnish. A species of *Rhus* (*R. Cotinus*, L.) affords the "young Fustic," of commerce—the "old Fustic," being the wood of *Morus tinctorio*, L. The Chian or Cyprus Turpentine is obtained from the *Pistacia Terebinthus*, L.

1. RHUS', L. SUMACH.

[Greek, *Rhous*,—or Celtic *Rhudd*,—red; the prevailing color of the fruit.]

Sepals 5, connected at base, persistent. *Petals* 5, ovate, spreading, and with the *stamens* inserted under the margin of an orbicular disk. *Drupe* small, nearly or quite dry; *nut* bony, 1-celled. Polygamo-dicecious *shrubs* or small trees. *Leaves* sometimes simple, mostly compound (odd-pinnate or trifoliate); *common petiole* enlarged at the base and covering the buds of the ensuing year.

* *Leaves* odd-pinnate.

† *Young branches* densely hairy.

1. *R. typhi'na*, L. Young branches and petioles densely villous leaflets in many pairs, acutely serrate, glaucous and somewhat pilose beneath; drupes densely pubescent.

TYPHA-LIKE RHUS. Staghorn Sumach.

Lactescent. Stem 10-15 or 20 feet high, and sometimes 4-6 inches in diameter, branched. Leaves composed of 8-15 or 20 pairs of lance-oblong leaflets (2-4 inches in length); common petioles 1-2 feet long. Flowers yellowish-green, in thyrsoid panicles,—the fertile panicles smaller and more compact. Ovaries clothed with a long greyish velvety pubescence—which on the fruit becomes a bright purple, and sharply acid.

Woodlands and banks of streams: Canada to Louisiana. Fl. June. Fr. September-October.

Obs. This is the largest and handsomest species of the genus—as seen in the Middle States. The fine purple clusters of fruit, on the fertile plant, render it quite ornamental; and, if introduced into the yards and public squares of our cities, would present an almost literal exemplification of the much-admired *R (h) us in urbe!* Its roots, however, are rather troublesome in sending up suckers.

†† Young branches downy-pubescent.

2. *R. copalli'na*, L. Common petiole winged; leaflets oblong or ovate-lanceolate, nearly entire.

COPAL RHUS. Dwarf Sumach.

Juice resinous. Stem 3-8 feet high, branched. Leaflets 1-3 inches long, usually 4-10 pairs with a terminal one, subcoriaceous, shining above. Flowers yellowish-green in terminal thyrsoid panicles. Fruit densely pubescent, finally dark purple and acid.

Dry hills, frequent. Fl. July. Fr. October.

Obs. A very neat species, with very variable leaflets, which are sometimes coarsely and unequally serrate.

††† Young branches smooth.



3. *R. gla'bra*, L. Branches and petioles glabrous; leaflets in many pairs, serrate, smooth on both sides, glaucous beneath.

GLABROUS RHUS. Common or Smooth Sumach.

Juice copiously milky. Stem 3-8 or 10 feet high, irregularly branching; young

FIG 56. Smooth Sumach (*Rhus glabra*), a staminate flower. 57. A pistillate flower. 58. The same divided, all much enlarged.

branches stout and thick, with a large pith, somewhat angular or compressed. *Leaves* composed of 8-12 or 15 pairs of *leaflets* (2-3 or 4 inches in length); *common petiole* 9-18 inches long, often dark purple. *Flowers* yellowish-green; the *fertile* panicles smaller and more compact than the sterile ones. *Ovaries* clothed with a short greyish silky pubescence, which on the *fruit* becomes bright purple, and contains a sprightly acid.

Old fields, fence-rows, and thickets: Canada to Louisiana. *Fl.* June. *Fr.* September-October.

Obs. This shrub is apt to be abundant in neglected sterile old fields; and its prevalence, in arable lands, is strong evidence of the occupant being a poor thriftless farmer.



A.H.

4. *R. venenata*, DC. Branches and petioles smooth; leaflets in few pairs, very entire; common petioles not winged; fruit glabrous.

POISONOUS RHUS. Poison Sumach. Poison Elder. Swamp Dogwood.

Juice resinous. *Stem* 8-12 or 15 feet high, branching above, young branches rather slender, terete, smoothish, slightly verrucose or dotted. *Leaves* composed of 3-5 or 6 pairs of *leaflets* (2-3 or 4 inches long); *common petioles* 4-10 or 12 inches long. *Flowers* greenish. *Panicles* slender, racemose, on long axillary peduncles. *Drupe*s dry, smooth and shining, nearly twice as large as in either of the preceding.

Low grounds along swampy rivulets: Canada to Georgia. *Fl.* June. *Fr.* September.

FIG. 59. Poison Sumach (*Rhus venenata*), a portion of a flowering branch, reduced.

Obs. This was formerly supposed to be identical with the oriental species which yields the *Japan Varnish*. It is a shrub to be carefully extirpated from the farm; as it is not only worthless, but exceedingly poisonous to many persons, if they come in contact with it—or even get unawares in its immediate vicinity.

**** Leaves trifoliolate.**



A.H.

5. R. Toxicodendron, L. Stem erect, decumbent, or climbing by rootlets; leaflets in threes, obliquely ovate or rhomboid, acuminate; fruit glabrous.

POISON-TREE RHUS. Poison-vine. Poison-oak. Poison-ivy.

Not *lactescent*. In the *erect variety*, stem 2–5 or 6 feet high; *leaflets* larger (4–6 or 8 inches long), variously or coarsely toothed or lobed; in the more common *climbing variety*, stem 8 or 10–30 or 40 feet long, branching, climbing and closely adhering to trees and other objects by means of numerous rootlets; *leaflets* smaller and more commonly entire than in the other variety: thin or somewhat membranaceous in both. *Flowers* yellowish green.

FIG. 60. Poison Ivy (*Rus Toxicodendron*), reduced.

Panicles slender, racemose, on short axillary peduncles. *Drupe*s about the size of those in the preceding species, dry, smooth, and shining, pale brown.

Woodlands and old fence-rows: Canada to Georgia, and the Rocky Mountains. *Fl.* May-June. *Fr.* September.

Obs. This species is also poisonous,—and should not only be known to the farmer, but diligently expelled from his premises. There are several other species of *Rhus* in the United States,—interesting to the Botanist—as all plants are,—but not immediately so to the practical Agriculturist. The Venetian Sumach (*R. Cotinus*) is often seen in cultivation as an ornamental shrub. The flowers are mostly abortive and the slender very hairy pedicels remain after flowering, increasing in length and making large light bunches, giving such a peculiar appearance to the shrub that it has received the popular name of “Smoke Tree.” The leaves of this and other European species furnish the Sumach of commerce, which is imported for use in dyeing and calico-printing and for tanning morocco leather. The leaves of *R. glabra*, *R. typhina* and perhaps others of our native species are used for the same purposes. Doct. Darlington has in his garden, at Westchester, a remarkable variety of *R. glabra*, in which the leaves are more or less completely bipinnate; it was found in Chester County, and is worthy of being propagated by the curious in such matters. *

ORDER XIX. VITA'CEÆ. (VINE FAMILY.)

Shrubby plants, generally with a loose stringy bark, and *stems* climbing by tendrils; simple or compound *leaves* opposite the racemes which are sometimes partly or wholly changed into tendrils. *Flowers* mostly in compound racemes, often polygamous or dioecious, small, greenish. *Calyx* very small, entire, or 4-5 toothed, lined with a perigynous disk. *Petals* 4-5, valvate in æstivation, sometimes cohering by the tips, caducous. *Stamens* as many as the petals, and opposite them. *Ovary* 2-celled, with 2 erect collateral ovules in each cell. *Fruit* a berry. *Seeds* with a bony *testa*; *embryo* much shorter than the horny or fleshy albumen.

1. VI'TIS, L. GRAPE.

[The ancient Latin name of the vine.]

Calyx obsoletely 5-toothed, lined with a fleshy disk which bears the stamens and pistils. *Petals* 5, cohering at apex and speedily falling off (pushed off by the stamens). *Stigma* sessile, obtuse. *Berry* 2-3-celled, 4-seeded,—some of the cells and seeds often abortive. *Perennial climbing shrubs*.

* *Flowers perfect (Foreign species)*

1. *V. VINIF'ERA*, L. Leaves lobed, sinuate-dentate, glabrous or tomentose; fruit of various sizes and colors.

WINE-PRODUCING VITIS. Wine Grape. Foreign Grape, &c.
Fr. La Vigne. *Germ.* Der Weinstock. *Span.* La Vid.

Stem 10-20 feet or more in length (but usually kept shorter by lopping.) *Leaves* more or less lobed and dentate, generally smaller than in our native species, sometimes very glabrous and shining. *Berries* often large, of various forms and colors.

Cultivated. Native of Southern Asia. *Fl.* June. *Fr.* August-September.

Obs. Many varieties (with names as numerous) of this plant have been

produced by long culture in different soils,—and a number of them are cultivated in the United States, for their delightful fruit; but the product is rather uncertain, in this climate, without great care and attention. The excellence of the fruit of the Vine—whether fresh, or dried and preserved in the state of Raisins—is universally known and appreciated; while the fermented juice of the Grape has been the theme of eulogy and song (and the excessive use of it, the cause of infinite mischief), from the earliest ages down to the establishment of Temperance Societies, in the present day. The Currants, of commerce (Corinths, or Grapes of Corinth)—often called Zante Currants—are believed to be a small-fruited, nearly seedless variety of this,—or perhaps a distinct yet nearly allied species.

**** Flowers diœcious-polygamous (Native species).**

2. V. Labrus'ca, L. Leaves roundish-cordate, somewhat 3-lobed, acutely dentate, densely tomentose beneath; racemes simple; berries large.

Fox-Grape, of the Northern States.

Stem 15–20 or 30 feet long, straggling over bushes and small trees. *Leaves* 4–6 inches in length—the tomentum beneath tawny; *petioles* 2–3 inches long. *Berries* globose, large (about half an inch in diameter), when mature varying in color from nearly black to dark amber and greenish-white—with a thickish coat, a tough central pulp, and a musky or rancid flavor.

Moist thickets, along streams: Canada to Georgia. *Fl.* June. *Fr.* September.

Obs. This grape is distributed from Canada to Texas, and presents a considerable variety in its fruit, being of various colors, and differing in form, size and flavor. In general the fruit has a strong and “foxy” flavor, but some of the varieties have this in a less degree and are highly esteemed. It is supposed that the generally cultivated Isabella and Catawba grapes are varieties of this, as are also several others.

3. V. æstiva'lis, Mx. Leaves broadly cordate, often 3–5-lobed or sinuately palmate, coarsely and unequally dentate, loosely tomentose beneath; fertile racemes mostly compound, long, many-flowered; berries small.

SUMMER VITIS. Little Grape. Common Wild Grape.

Stem 20–40 and sometimes 60 feet or more in length. *Leaves* 4–8 inches long, often palmately lobed with rounded sinuses—the younger ones with a loose cobweb-like russet pubescence beneath, which becomes coarser and more hirsute with age, and sometimes nearly disappears. *Berries* globose, small (generally about one-fourth of an inch in diameter), deep blue or bluish black when mature, and covered with a fine glaucous powder—the skin thinnish, and the flavor (especially after a little frost) a sprightly agreeable acid.

Rich woodlands and thickets: Connecticut to Florida. *Fl.* June. *Fr.* October.

Obs. This is the tallest climber of all our Grape-vines, in Pennsylvania; and I have seen an old vine, of this species, 8–10 inches in diameter, at base. The fruit varies in size and quality,—the best specimens being well worthy of culture. I have cultivated a native of this vicinity, in which the fruit often equals that of the “English Grape” (or Miller’s



Burgundy,) in size ; and although somewhat harshly acid, it abounds in a rich purple juice, at maturity,—and makes a fine preserve for pastry.

4. *V. cordifo'lia*, Mx. Leaves thin, cordate, acuminate, sharply and coarsely toothed, smooth and green on both sides ; racemes slender, large, loosely compound ; berries small.

HEART LEAVED VITIS. Chicken Grape. Winter or Frost Grape.

Stem 10–20 feet long, climbing and spreading over bushes. *Leaves* 2–6 inches long, smooth, the nerves pubescent beneath. *Flowers* greenish, in loose racemes which often

FIG. 61. Leaf and tendril of the common Fox Grape (*Vitis labrusca*). **62.** An unexpanded flower bud, much enlarged. **63.** An open flower, showing the petals cohering by their tips and falling away in one piece.

have long abortive branches at base retrograding into tendrils. *Fruit* small, greenish amber color, or sometimes nearly black when mature, ripening after frost, very acerb.

Thickets, &c.: frequent. *Fl.* June. *Fr.* November.

Obs. The flowers of this vine are delightfully fragrant. The fruit though too acid for eating is said to afford a very fine wine. There is a variety with broader and more cut and toothed leaves (var. *riparia*, Gray.)

5. *V. vulpi'na*, L. Stem and branches with a close greyish-brown bark; leaves orbicular, coarsely toothed with bluntish teeth, cordate at base, smooth and shining on both sides; fertile racemes compound, umbellulate; berries large.

VULPINE OR FOXY VITIS. Fox-Grape, of the Southern States; also called "Muscadine," and "Bullet- or Bull-Grape."

Stem 20-50 feet or more in length, with an adhesive greyish minutely warty bark. *Leaves* 2-3 inches in diameter. *Berries* globose, large (half an inch to three quarters in diameter), bluish black when mature, with a thick tough skin and not unpleasant flavor.

Woodlands and banks of streams: Virginia to Florida. *Fl.* May-June. *Fr.* July-August.

Obs. The most striking feature of this vine, is the close even texture of its grey bark,—somewhat resembling that of the Beech-tree, or Hornbeam; while all the other species, so far as I know, have a loose, lamellated, stringy, dark-brown bark, after the first year's growth. It is quite probable, as suggested by Mr. ELLIOTT, that this is the original "Fox-Grape," or *V. vulpina*, of LINNAEUS. I have observed it growing in abundance in the vicinity of the village of Suffolk, Virginia; but have not seen the fruit. The inhabitants assured me, however, that the large black berries were quite palatable,—and were uniformly, in that region, known by the name of Fox-grapes. Mr. ELLIOTT thought the species might be, some day, advantageously cultivated.

2. AMPELOP'SIS, *Mx.* VIRGINIA CREEPER.

[Greek, *Ampelos*, a vine, and *opsis*, aspect; from its resemblance to the vine.]

Calyx slightly 5-toothed, without a lining disk. *Petals* 5, concave, thick, opening at apex, expanding before they fall.

1. *A. quinquefo'lia*, *Mx.* Leaves digitate, with 5 oblong lanceolate leaflets; flowers in cymose clusters.

FIVE-LEAVED AMPELOPSIS. Virginia Creeper. American Ivy.

Stem 10-50 feet long, diffusely branching, climbing trees and walls, adhering to them by sucker-like expansions at the tips of the tendrils. *Leaflets* 2-4 inches long with a few mucronate teeth, smooth; *common petiole* 2-6 inches long. *Flowers* yellowish-green. *Berries* bluish-black; *peduncles* crimson.

Woods and rocks: common. *Fl.* July. *Fr.* October.

Obs. This native vine is one of the most ornamental of the climbers and is much cultivated, both in this country and in Europe for covering walls and buildings. It is perfectly hardy and gives a dense mass of brilliant green throughout the summer which in the autumn changes to the richest shades of crimson and purple.



64



65

ORDER XX. RHAMNA'CEÆ. (BUCKTHORN FAMILY.)

Shrubs or *small trees* having simple mostly alternate *leaves* with *stipules* minute or obsolete, and small, regular, sometimes apetalous *flowers*. *Stamens* 4–5, perigynous, as many as the valvate sepals, alternate with them and opposite the hooded or concave petals. *Stamens* and petals inserted on the edge of a *fleshy disk* which lines the tube of the calyx and sometimes coheres with the lower part of the 2–5-celled *ovary*. *Stigmas* 2–5. *Fruit* a *drupe* or *pod* with 1-seeded cells; *seeds* not arilled, *embryo* large, in a sparing fleshy *albumen*.

1. RHAM'NUS, *Tournef.* BUCKTHORN.

[An ancient Greek name, alluding to its numerous branchlets.]

Calyx 4–5-cleft, the bell-shaped tube lined with the thin disk. *Petals* 4–5, small, notched at the end, short-clawed, wrapped round the short *stamens* or sometimes wanting. *Ovary* free, 2–4-celled. *Fruit* a berry.

FIG. 64. A palmately compound leaf of Virginia Creeper (*Ampelopsis quinquefolia*). 65. An enlarged flower.

like drupe containing 2-4 separate, cartilaginous seed-like nutlets which are grooved on the back, as is the contained seed. *Shrubs* or small *trees* with loosely pinnately-veined *leaves* and axillary clusters of greenish polygamous or diœcious *flowers*.

1. *R. CATHARTICUS*, *L.* Erect; branches thorny at the summit; leaves ovate, minutely serrate; flowers with the parts in fours; fruit nearly spherical, 4-seeded.

CATHARTIC RHAMNUS. Buckthorn.

Shrub or low tree with greyish bark. *Branchlets* ending in sharp points, being stiff leafy thorns. *Leaves* 1-2 inches long, with a short abrupt acumination, smooth above, often somewhat hairy on the 7-9 prominent veins beneath. *Fertile flowers* with abortive stamens. *Sterile flowers* with an abortive ovary. *Fruit* black, nauseous and cathartic.

Cultivated and spontaneous. *Fl.* May. *Fr.* October.

Obs. This shrub is a native of Europe and has become quite naturalized in some places. The berries are a violent cathartic and were formerly much used, in the form of syrup, in domestic practice. Before they are fully ripe and treated with alum, the berries furnish the water-color known as sap-green. The chief use of the plant is to form hedges, a purpose for which it is well suited, being quite hardy and bearing severe pruning: moreover it puts out its foliage early in the season and retains it until late. It is propagated by sowing the seeds, fresh from the tree in the fall; planted in this way they vegetate in the following spring. *

ORDER XXI. CELASTRA'CEÆ. (STAFF-TREE FAMILY.)

Shrubs, rarely trees, with alternate or opposite simple *leaves*, minute fugacious *stipules* and small regular *flowers* with the parts in fours or fives and imbricated in the bud. *Stamens* as many as the petals and alternate with them, inserted under the flat disk that lines the bottom of the calyx. *Ovary* 2-5-celled, with one or few (erect or pendulous) ovules in each cell. *Fruit* 2-5-celled, free from the calyx. *Seeds* arilled; *embryo* large in a fleshy *albumen*.

1. CELAS'TRUS, *L.* STAFF-TREE.

[A name borrowed from the ancient Greek writers.]

Polygamo-diœcious. *Sepals* 5, connected at base. *Petals* and *stamens* 5, inserted on the margin of the cup-shaped disk. *Fruit* a globose 3-celled, 3-valved capsule, opening loculicidally. *Seeds* 1-2 in each cell, erect, enveloped in a scarlet *aril*. *Leaves* alternate; *flowers* small and greenish.

1. *C. scan'dens*, *L.* Stem woody, twining, unarmed; leaves ovate-oblong, finely toothed, pointed.

CLIMBING CELASTRUS. Wax-work. Climbing Bitter-sweet.

Stem 10-15 feet long. *Leaves* 2-4 inches long, on *petioles* about $\frac{3}{4}$ of an inch in length. *Flowers* yellowish-green, in small racemes terminating the short branches. *Fruit* about the size of large peas, orange color when mature, opening at length and exposing the seeds enveloped in their scarlet *aril*.

Common in thickets and along streams. *Fl.* June. *Fr.* Oct.



Obs. This is noticed as being one of our most elegant native climbers ; it is highly ornamental when trained upon a trellis-work, or around the supports of a piazza. The fruit presents, in autumn, a most brilliant appearance, and is a conspicuous object in dry bouquets. The plant is readily propagated by seeds and by layers. The Burning Bush or Spindle Tree (*Euonymus atropurpureus*, Jacq.) belongs to the same family ; it is an upright shrub with deeply-lobed capsules of a deep red color, and presents a most brilliant appearance after the leaves have fallen. *

ORDER XXII. SAPINDACEÆ. (SOAP-BERRY FAMILY.)

Trees or shrubs with opposite or alternate mostly compound leaves, no stipules and (often polygamous) mostly irregular and unsymmetrical flowers. Petals and sepals 4-5, imbricated in the bud. Stamens 5-10 inserted on a fleshy disk, commonly more numerous than the petals or sepals, but rarely twice as many. Ovary 2-3 celled and lobed. Fruit capsular or berry-like. Seeds without albumen ; cotyledons thick and fleshy.

FIG. 66. The Climbing Staff-tree, or Wax-work, (*Celastrus scandens*). 67. The fruit.

1. *ÆS'CULUS*, L. HORSE-CHESTNUT.

[The ancient name of a tree which bore esculent fruit.]

Trees or shrubs. Leaves opposite, without stipules; leaflets to penninerved. *Flowers* unsymmetrical, in large showy terminal thyrsoid panicles or racemes, often polygamous. *Calyx* of 5 connected sepals. *Petals* 5 (or sometimes 4, by the suppression of the lower one), unequal. *Stamens* 6–8. *Ovary* 3-celled; *styles* united into one. *Fruit* a subglobose coriaceous capsule, echinate or unarmed, mostly 1-celled by abortion, 2–3-valved with a loculicidal dehiscence. *Seed* mostly solitary by abortion, large, subglobose, with a smooth shining reddish-brown coat and broad paler *hilum*, destitute of albumen; *cotyledons* very thick and fleshy, gibbous, cohering or soldered together, remaining under ground in germination.

1. *Æ. HIPPOCAS'TANUM*, L. Leaflets in sevens, obovate-cuneate, acute, dentate; flowers 5-petaled; fruit prickly.

HORSE-CHESTNUT *ÆSCULUS*. Horse-chestnut.

Fr Maronnier d' Inde. *Germ.* Die Rosskastanie. *Span.* Castaño de Indias.

Stem 30–50 or 60 feet high, and 1–2 feet in diameter, with numerous symmetrical rather erect branches. *Leaflets* 4–6 or 8 inches long; *common petioles* 4–6 inches long. *Flowers* white or ochroleucous, with red spots and tinges of yellow.

Cultivated. Native of Asia. *Fl.* May. *Fr.* Oct.

Obs. This ornamental tree (which is often called *English Horse Chestnut*, because it came to us by way of England—but which originally came from Northern India—) has not been as generally introduced as it deserves to be. It is symmetrical and handsome, and although of slower growth than some others, it is, in my opinion, well worth waiting for—on account of its rare beauty, and the perfect shade it affords. The young shoots, or branches of each year, complete their development, and come to a full stop, early in the summer,—the residue of the season being requisite to harden and prepare them to endure the succeeding winter; and no secondary branches are ever put forth during growth. This tree has usually been remarkably exempt from the depredations of insects, but during the past summer (1858) it has been, in some localities, badly infested by them. In Philadelphia, numerous fine specimens were completely stripped of their foliage and probably the future vigor of the trees much impaired. The red flowering Horse-chestnut (*Æ. RUBICUNDA* and *CARNEA* of the horticulturists) is probably a variety of this; it is a smaller tree and exceedingly beautiful when in flower.

2. *Æ. Pa'via*, L. Leaflets 5; calyx tubular; petals 4, erect and connivent, the upper 2 longest; stamens not longer than the corolla, fruit smooth.

Red Buckeye.

Shrub or small tree. Leaflets somewhat doubly serrate, shining above, smooth or somewhat downy beneath. Flowers large, in a loose thyrsus, calyx and corolla bright red. Virginia, Kentucky and southward. May.

Obs. The bruised branches of this are said, by Elliott, to be employed to stupify fish. Several other species are natives of the western and southern States, known by the name of Buckeye, "from a resemblance of the seeds to the eye of that animal. These native trees, by reason of their abundance, have become the popular emblem of *Ohio*—which is known throughout the Union by the soubriquet of the *Buckeye State*." The wood of the various species is of little value. The seeds contain an acrid and narcotic principle and abound in starch, which has been manufactured from the common Horse-chestnut in Europe. The roots yield a mucilaginous matter which is sometimes used as a substitute for soap in washing woollens. *

ORDER XXIII. ACERA'CEÆ. (MAPLE FAMILY.)

Trees with a sweet sap, opposite leaves without stipules, and polygamo-dicecious, regular but often apetalous and unsymmetrical flowers. Stamens and petals inserted on a fleshy, lobed disk. Fruit a pair of more or less diverging separable 1-seeded winged keys (samaras) with the outer margin thicker and obtuse. Seeds without albumen; embryo coiled or folded; cotyledons long and thin.

1. A'CER, L. MAPLE.

[The ancient classical name of the Maple.

Flowers polygamous. Calyx colored, 5-lobed. Petals 5 or often none. Stamens 4–12. Styles 2, long and slender, united below. Ovary 2-celled with 2 ovules in each cell. Fruit 2 1-seeded winged keys.

* *Flowers in pendulous racemes or corymbs, appearing with the leaves.*

† *Petals 5.*

1. A. PSEUDO-PLA'TANUS, L. Leaves heart-shaped at base, 5-lobed, unequally toothed; flowers in terminal pendulous racemes; fruit diverging.

FALSE-PLATANUS ACER. Sycamore. Greater Maple.

A large tree when fully grown. Leaves 4–6 inches long, on petioles about the same length. Racemes about 6 inches long; rachis and filaments hairy; flowers yellowish green, the sepals and petals nearly alike; fruit smooth.

Cultivated. Native of Europe. April.

Obs. This has been introduced as an ornamental shade tree; but I consider our own Sugar Maple and the Norway Maple, as decidedly preferable, notwithstanding Cowper's lines:

"—— nor unnoted pass

The Sycamore, capricious in attire,
Now green, now tawny, and, ere autumn yet
Have changed the woods, in scarlet honors bright."

Both this and the Plane Tree (*Platanus*), are vulgarly called Sycamore in our language; but why, is not apparent. The true "Sycamore"—(perhaps the tree which ZACCHERUS climbed)—is a species of Fig-tree (*Ficus Sycomorus*, L.)

2. A. PLATANOI'DES, L. Juice milky ; leaves broadly heart-shaped, 5-lobed, coarsely toothed ; flowers somewhat corymbose ; fruit divaricate, smooth.

PLATANUS-LIKE ACER. Norway Maple.

A large tree when full grown. *Leaves* 4-6 inches in length and rather wider than long, deep shining green ; *petioles* about as long as the leaves, when broken exuding a *milky juice*. *Flowers* pale greenish-yellow, in loose terminal, somewhat pendulous corymbs. *Keys* remarkably divaricate.

Cultivated. Native of Europe. April.

Obs. This tree has been but recently introduced ; yet it promises to become one of our most desirable shade trees. Its foliage is remarkably fine, and abundant, continuing green longer than most other species ; and it is said that its milky juice prevents the ravages of insects.

†† *Petals none.*

3. A. sacchari'num, L. Leaves broad, subcordate at base, 3-5-lobed with the sinuses obtuse,—the lobes acuminate, coarsely and sparingly sinuate-dentate ; flowers apetalous, pendulous on long filiform, villous, fasciculate pedicels ; fruit turgid, smooth.

SACCHARINE ACER. Sugar Maple.

Stem 50-80 feet or more in height, and 2-3 feet in diameter. *Leaves* 3-5 inches long, and generally rather wider than long, dark green above, paler beneath ; *petioles* 2-4 inches long. *Calyx* pale greenish-yellow, truncate and cup-like, the limb fringed with long hairs. *Petals* none. *Fruit* ovoid at base, about an inch long—including the wing—slightly diverging.

Rich woodlands : Canada to Georgia. *Fl.* April-May. *Fr.* Sept.

Obs. This is one of the most valuable and interesting of our native trees,—particularly in the forests of the North and West—where its sap, in early spring, yields an immense quantity of Sugar and Syrup. The beautiful wood, known as Bird's-eye Maple—so much admired in cabinet work—is obtained from this species ; and it is, moreover, rarely surpassed, in any respect, as an ornamental shade tree. The Black Sugar Maple (*A. nigrum, Michx.*) is regarded as only a variety of this ; its leaves are usually somewhat larger and of a darker green, and of a thicker and somewhat leathery texture. The wood of the Sugar Maple is highly valued as fuel, ranking near hickory ; it also furnishes a fine quality of charcoal.

**** Flowers in short erect clusters, from lateral leafless buds, preceding the leaves.**

† *Petals none.*

4. A. dasycar'pum, Ehrh. Leaves palmately and deeply 5-lobed with the sinuses acute, the lobes unequally incised-dentate ; ovary densely tomentose.

HAIRY-FRUITED ACER. Silver-leaved Maple. White Maple.

Stem 30-60 feet high, and 2 feet or more ("in the Western States sometimes 8-9."—*Torr. & Gr.*) in diameter, much branched,—the young branches virgate and straggling or drooping. *Leaves* 3-6 inches long, bluish white or glaucous beneath ; *petioles* 2-5 inches long. *Flowers* in fascicles mostly of fives and sevens. *Calyx* pale green, truncate and

cup-like. *Petals* none. *Fruit* (including the wing) 2-3 inches long, one of the carpels usually abortive; pedicels of the fruit an inch long. *Seeds* large; *embryo* nearly straight. Banks of rivers: Maine to Georgia. *Fl.* April. *Fr.* May-June.

Obs. This has been extensively introduced into our cities and villages, as an ornamental tree,—and is often mistaken for the true Sugar Maple. It appears, indeed, from the researches of Prof. A. GRAY, that LINNAEUS established the *A. saccharinum* upon a specimen of this plant; but, as it was done under a misapprehension of its character, the name has been very properly transferred, by all succeeding Botanists, to the real sugar-producing species. The Silver Maple, however, is by no means to be compared with the Sugar Maple, even as a shade tree,—and much less for its economical value.

†† *Petals* 5.



5. *A. ru'brum*, L. Leaves generally 3-lobed with the sinuses acute, subcordate at base,—the lobes acute, spreading, unequally incised-dentate; flowers aggregated on rather long pedicels; ovary glabrous. **RED ACER.** Red Maple. Swamp Maple.

Stem 40-60 or 80 feet high, and 1-2 feet or more in diameter, branched, the young branches purplish. *Leaves* 2-4 inches long; *petioles* 1 or 2-5 inches long. *Flowers* appearing before the leaves, in fascicles of fives. *Calyx* petaloid, and with the petals bright purple, or often yellowish-tawny. *Fruit* (including the wing) near an inch long.

FIG. 68. A leaf of the Red Maple (*Acer rubrum*), with its winged key-fruit (samaras.) 69. A staminate flower. 70. A pistillate flower, both enlarged.

Moist low grounds ; swampy woodlands : Canada to Florida. *Fl.* March - April. *Fr.* September.

Obs. The variety with yellowish or tawny flowers is quite common in Pennsylvania,—and in a pretty extensive examination, I find those flowers generally staminate and sterile (rarely perfect) ; while the bright purple flowers are constantly perfect. The wood of the Red Maple—especially that variety or form of it, known as Curled Maple—is much used in the manufacture of various articles of furniture, &c., and the refuse timber makes excellent fuel. The bark affords a dark purplish-blue dye, and makes a pretty good bluish-black ink. The sap of all the species is more or less saccharine.

2. NEGUN'DO, *Moench.* BOX-ELDER.

[Origin of the name obscure.]

Diœcious. *Calyx* minute, 4 - 5-cleft. *Petals* none. *STAMINATE Fl.* mostly with 5 stamens on capillary clustered pedicels. *PISTILLATE Fl.* in simple slender pendulous racemes. *Fruit* as in *Acer*. *Leaves* pinnate.

1. *N. aceroi'des*, *Moench.* Leaves pinnate in threes or fives ; leaflets rhombic-ovate, coarsely cut-toothed.

ACER-LIKE NEGUNDO. Box-elder. Ash-leaved Maple.

Stem 20 - 40 feet high, branched ; young branches with a yellowish-green bark. *Leaflets* mostly 3, sometimes odd-pinnate in fives, 3 - 5 inches long ; *common petioles* 3 - 4 inches in length. *Flowers* yellowish-green, from lateral buds ; *ovaries* hairy ; *fruit* diverging.

Low grounds : Middle and Southern and Western States. April.

Obs. A handsome little tree, more abundant in the South and West than in the Eastern states.

ORDER XXIV. POLYGALA'CEÆ. (MILKWORT FAMILY.)

Herbs with mostly alternate simple and entire *leaves*, without *stipules*, and irregular somewhat papilionaceous *flowers*. *Stamens* 4 - 8, diadelphous ; *anthers* 1-celled, opening by a pore at the summit. *Style* curved, often hooded. *Fruit* a 2-celled 2-seeded capsule.

1. POLYGA'LA, *Tournef.* MILKWORT.

[Greek, *Poly*, much, and *Gala*, milk ; from its supposed influence on the lacteal secretion.]

Sepals 5, persistent ; the upper and two lower ones small, greenish ; the two lateral ones (called *wings*) much larger and petal-like. *Petals* 3, hypogynous, connected with each other and with the stamen-tube ; the middle or lower one keeled, often crested. *Capsule* compressed contrary to the narrow partition, loculicidal. *Seeds* with a caruncle or variously shaped appendage at the hilum.

1. *P. Sen'ega*, *L.* Perennial, stems simple, terete ; leaves alternate, elliptic-lanceolate, the upper ones acuminate ; raceme terminal, spike-

form; wings of the calyx orbicular-obovate, concave, rather longer than the petals.

Seneka Snake-root. Milkwort. Mountain Flax.

Root perennial, thick and somewhat woody, with coarse branches. *Stems* usually several from the same root, 9–15 inches high, herbaceous and rather flaccid. *Leaves* 1 or 2–4 inches long—those near the root small, ovate and scale like. *Flowers* greenish-white. *Capsule* orbicular. *Seeds* large, pyriform, hairy, the arillus-like caruncles nearly as long as the seeds.

Hilly woodlands : Canada to North Carolina. *Fl.* May. *Fr.* July.

Obs. The root of this species is so valuable for its medicinal properties—as a stimulating expectorant, in croup, &c.,—that although not a plant of agricultural interest, every farmer ought to know its character, and be able to recognise it when he sees it.

ORDER XXV. LEGUMINO'SÆ. (PULSE FAMILY.)

Herbs, shrubs or trees with alternate stipulate and usually compound leaves, and papilionaceous or regular flowers. *Stamens* mostly 10 (rarely 5, sometimes many) monadelphous, diadelphous (9 and 1), or rarely distinct. *Pistil* simple, becoming a legume in fruit. *Seeds* without albumen, attached to the upper suture of the pod.

This vast family—comprising upwards of 400 genera—is as important as it is comprehensive. Among the remarkable plants, or products, belonging to the Order, and not here described, may be mentioned—on account of their value, beauty or other characteristics—the Logwood (*Hæmatoxylon Campechianum*, L.)—the Braziletto, or Brazil Wood (*Cæsalpinia Brasiliensis*, L.)—the Rose Wood (a species of *Mimosa*)—the Sissoo Wood of India (*Dalbergia Sissoo* Roxb.)—the Red Sandal Wood (*Pterocarpus santalinus*, L.)—the Liquorice plant (*Glycyrrhiza glabra*, L.)—the Tamarind tree (*Tamarindus Indica*, L.)—the Tonka Bean (*Dipterix odorata*, Willd.)—the Senna of the Shops (*Cassia Senna*, L.)—the plants yielding Gum Arabic (species of *Acacia*), and various other gums and balsams—the pretty Laburnum (*Cytisus Laburnum*, L.)—and the wonderful Sensitive plant (*Mimosa pudica*, L.), &c., &c. The famous Chinese condiment called “Soy,” is also obtained from the seeds of a plant (*Dolichos Soja*, L., or *Soja hispida*, DC.) belonging to this Order; and the bean called “Dhal,” in Bengal, is, I believe, the seed of the *Cajanus flavus*, DC.

The numerous genera comprised in this Order are disposed in several sub-orders, tribes and sub-tribes. Those described in this work are arranged in the following synopsis :

1. TRUE PULSE FAMILY. PAPILIONACEÆ.

Calyx of 5 sepals more or less united, often unequally so. *Corolla* irregular. *Papilionaceous*, consisting of 5 unequal petals inserted in the base of the calyx, the upper called the *standard* (vexillum) larger than the others and enclosing them in the bud. The two lateral called *wings* are exterior to the two lower, which are more or less united at their edges and form the *keel*, which usually encloses the stamens and pistil. *Stamens* 10 (rarely 5), diadelphous, sometimes monadelphous, or distinct. *Ovary* 1-celled. *Cotyledons* large and thick, *radicle*, mostly incurved. *Leaves* simple or compound.

* *Stamens* monadelphous or diadelphous. *Pod* continuous and 1-celled, or sometimes 2-celled lengthwise. *Cotyledons* becoming green leaves in germination. Not climbing or twining (except *Wistaria*), nor tendril bearing.

Stamens monadelphous; anthers of 2 forms. *Leaves* simple.

Stamens diadelphous (9 & 1). *Leaves* palmately 3- (or rarely pinnately 5-) foliolate. *Pods* small, resembling akenes. *Herbs*.

Flowers in heads. *Pods* thin, enclosed in the persistent calyx, 1–6-seeded.

Flowers in racemes, or spikes.

Pods wrinkled, coriaceous.

Pods curved or spirally coiled.

1. GENISTA.

2. TRIFOLIUM.

3. MELILOTUS.

4. MEDICAGO.



Stamens diadelphous. Pods several-seeded, at length 2-valved, 1-celled (rarely with cellular partitions between the seeds). Leaves unequally pinnate. Flowers in racemes.

Pods flat and thin, margined on one edge. Trees or shrubs; leaflets stipellate.

5. ROBINIA

Pods tumid marginless. Shrubs with long twining stems; leaflets not stipellate.

6. WISTARIA.

Keel with a subulate spur on each side. Pods deflected on the pedicel, with cellular partitions between the truncate seeds. Herbaceous.

7. INDIGOFERA

** Stamens diadelphous. Pod continuous, 1-celled. Cotyledons remaining under ground in germination. Herbs with the common petiole generally produced into a bristle or tendril. Leaves without tendrils.

Leaves odd-pinnate in 4-6 pairs.

Pods inflated, 2-seeded.

8. Cicer.

Leaves equally pinnate. Pods formed under ground.

9. ARACHIS.

Leaves with tendrils.

Tendril simple, nearly obsolete.

Seeds large, fixed by one end.

Stem erect.

10. FABA.

Tendrils nearly simple. Seeds small, lenticular, 2 in each pod.

11. ERVUM

Tendrils long and branching, calyx lobe leafy. Stipules large. Seeds globular.

12. PISUM.

Tendril conspicuous, calyx lobes not leafy. Style hairy.

13. VICIA.

*** Stamens diadelphous. Cotyledons rising above ground in germination. Twining herbs, leaves without tendrils. Flowers in racemes. Keel spiral.

14. PHASEOLUS.

Stamens 10 distinct. Keel petals distinct. Pods inflated. Leaves palmately 3-foliolate.

15. BAPTISA.

2. BRASILETTO FAMILY. CÆSALPINEÆ.

Corolla nearly regular, often somewhat papilionaceous, the standard then within the other petals. Stamens 10 or fewer, distinct.

Flowers imperfectly papilionaceous, reddish, appearing before the simple roundish heart-shaped leaves. Trees.

16. CERCIS.

Flowers not papilionaceous. Herbs with simply pinnate leaves and yellow flowers.

17. CASSIA.

Trees with leaves mostly twice pinnate. Flowers not at all papilionaceous, diœcious or polygamous.

Flowers diœcious. Stamens 10 and petals 5, inserted on the summit of the funnel-shaped calyx-tube. Pod broad and hard. Leaves 2-pinnate.

18. GYMNOCLADUS.

Flowers polygamous. Stamens and Petals 3-5 on the bottom of the open calyx. Pod long and flat. Leaves 1-2-pinnate.

19. GLEDITSCHIA.

FIG. 71. The common Pea (*Pisum sativum*), showing a pinnate leaf with very large stipules, terminated by a tendril; a papilionaceous flower and an immature legume.



72



78

FIG. 72. An enlarged flower of a Pea (*Pisum sativum*) divided to show the position of the parts; illustrating the general structure of the true Pulse Family (*Papilionaceæ*). *a* Sepals. *b* Outer petal or banner. *c* One of the side petals or wings. *d* One of the two lower petals which form the keel. *e* Stamen tube. *f* The ovary containing the ovules. **78.** Pea flower with petals and calyx removed; showing the united stamens (diadelphous 9 & 1), enclosing the pistil.

1. GENIS'TA, L. WOAD-WAXEN.

[Name from the Celtic *gen*, a bush.]

Calyx 2-lipped. *Standard* oblong-oval, spreading. *Keel* oblong, straight, scarcely enclosing the stamens and style. *Stamens* monadelphous, the sheath entire; 5 alternate anthers shorter. *Pod* flat, several-seeded. *Shrubby* plants. *Leaves* simple. *Flowers* yellow.

1. *G. TINCTO'RIA*, L. Low, thornless, with striate angled erect branches; leaves lanceolate; flowers in spiked racemes.

DYER'S GENISTA. Woad-waxen. Whin. Dyer's Green Weed.

Stem about a foot high, erect or ascending. *Leaves* sessile, rather distant. *Flowers* bright yellow with a small bract at the base of each.

A native of Europe, Massachusetts and E. New York. June-July.

Obs. This plant has become thoroughly naturalized in some places, especially in Eastern Massachusetts, where it is so abundant in some localities as to give to the hill-sides a yellow appearance when in flower. It abounds in coloring matter, and is used to dye wool yellow. It is said that when cows feed upon it their milk becomes bitter. It has some medicinal reputation, and is a popular remedy among the Russian peasantry for hydrophobia.

2. TRIFO'LIUM, L. CLOVER.

[Latin, *tres*, three, and *folium*, leaf; characteristic of the genus.]

Calyx tubular, persistent, 5-cleft; segments subulate. *Corolla* usually withering; *petals* more or less united, and mostly free from the stamens; *keel* shorter than the wings and vexillum. *Legume* small, membranaceous, scarcely dehiscent, 1 - 2- (rarely 3 - 4-) seeded, mostly included in the calyx-tube. *Flowers* mostly in heads or spikes. *Stipules* adnate to the base of the petiole.

* *Florets* sessile in compact heads; *corolla* purple or pale pink and spotted.

1. *T. arvénse*, L. Stem erect, pilose; leaflets linear-obovate or spatulate, minutely 3-toothed at apex; stipules narrow, subulate-acuminate; heads oblong-cylindric, softly villous; calyx-segments longer than the corolla; petals scarcely united.

FIELD TRIFOLIUM. Stone Clover. Welsh Clover. Rabbit-foot.

Fr. Pied de Lievre. *Germ.* Der Hasen Klee. *Span.* Pié de Liebre.

Whole plant softly pilose. *Root* annual. *Stem* 6-12 inches high, slender, generally much branched. *Leaflets* half an inch to an inch long; *common petioles* one-fourth of an inch to an inch long. *Corolla* inconspicuous, whitish or pale pink, with a purple spot on the wings. *Legume* 1-seeded.

Sterile old fields: Canada to Florida: introduced. Native of Europe. *Fl.* June-August. *Fr.* August-October.

Obs. This species—a naturalized foreigner—is only entitled to the notice of the farmer on account of its prevalence and its worthlessness. Its presence is a pretty sure indication of a thin soil, and neglected Agriculture: and the appropriate remedy is to improve both. It is then easily superseded by more valuable plants.

2. *T. pratense*, L. Stems ascending; leaflets oval or ovate-oblong, often retuse; stipules broad, terminating in a bristle-like point; heads ovoid, dense-flowered, sessile, bracteate at base; calyx-segments scarcely half as long as the corolla, the lower one longer than the others.



MEADOW TRIFOLIUM. Red Clover. Common Clover.

Fr. Trèfle des Prés. *Germ.* Der Wiesen-Klee. *Span.* Trebol.

Root biennial, or perennial? large, fusiform. *Stems* several from the same root, 1-2 or 3 feet long, rather weak at base and often decumbent, somewhat branched, striate and pilose. *Leaflets* half an inch to an inch and a half long, sessile, usually with a broad paler spot in the middle, hairy beneath; *common petiole* half an inch to 4-5 inches long. *Heads* of flowers ovoid or subglobose, an inch or more in diameter. *Corolla* purplish-red (rarely white)—the petals all united into a slender tube about half an inch in length. *Legume* 1-seeded, included in the calyx. *Seed* reniform, greenish-yellow with a shade of reddish brown.

Cultivated fields, meadows, &c. Canada to Florida: introduced. Native of Europe. *Fl.* May-Sept. *Fr.* July-October.

Obs. This plant (which is sometimes spoken of in works upon agriculture as a grass.) is one of the most valuable forage plants. It is thoroughly naturalized; but it is also diligently cultivated by all good farmers. In conjunction with the grasses—especially with Timothy (*Phleum pratense*) it makes the best of hay—though by itself it is rather indifferent pasture. Its culture exerts a most kindly influence on the soil, and its introduction as an ameliorating crop, has had a most beneficial influence upon Agriculture. It is the crop most frequently cultivated to “turn in,” and thus enrich the soil with organic matter. The plant is generally considered to be a biennial; but Mr. JOSHUA HOOPES—who is a very acute observer—assures me, he has satisfactorily ascertained that the plant will live more than two years. It is not known at what time clover came into general cultivation in this country; but it is recorded that JOHN BARTRAM had fields of it, prior to the American Revolution. The flowers contain much nectar,—but the tube of the corolla is so long that the Honey Bee cannot reach the treasure with its proboscis; and conse-

FIG. 74. A cluster or head of the flowers of Red Clover (*Trifolium pratense*), and a trifoliate leaf. 75. A separate flower, enlarged. a A pod, or rounded legume. b The seed. c The embryo removed from the seed coat.

quently that insect rarely alights on the heads, but leaves them to the more amply provided Humble Bee. I have met with a number of instances in which the corolla was replaced by five distinct green leaflets—with other modifications of the flower, which finely illustrated Goethe's theory of retrograde metamorphosis. The nearly related Zigzag Clover (*T. medium*), which has entire and spotless leaflets and larger, deeper purple, and mostly stalked heads, is naturalized in E. Massachusetts.

**** Florets pedicellate in umbel-like round heads; corolla white or rose-color; turning brownish in fading; the short pedicels reflexed when old.**

3. *T. re'pens*, L. Stems creeping, diffuse; leaflets roundish-obovate and emarginate, or almost obcordate, denticulate; heads depressed-globose, on very long axillary peduncles; legumes about 4-seeded.

CREEPING TRIFOLIUM. White Clover. Dutch Clover.

Fr. Triolet. **Trèfle blanche.** **Germ.** Weisser-Klee. **Span.** Trebol blanco.

Root perennial. *Stem* 4–12 or 15 inches long, smooth, procumbent, radicate, diffusely branching from the base. *Leaflets* half an inch to an inch long; *common petiole* 1 or 2–6 or 8 inches long. *Heads* of flowers on erect sulcate naked peduncles which are from 2–8 and twelve inches in length. *Corolla* white, withering and becoming a pale dirty brown. *Legume* $\frac{1}{4}$ – $\frac{1}{2}$ of an inch long, torulose, 2 or 3–5-seeded. *Seeds* irregularly ovoid, reddish-brown.

Pastures, woodlands, &c., throughout the United States. *Fl.* May–September. *Fr.* July–October.

Obs. The pedicellate florets are somewhat corymbose—forming depressed-globose or vertically flattened heads. The outer or lower florets open first, and are successively reflexed,—so that, during the process of flowering, the heads appear horizontally divided between the withered and the young or opening florets. This species is everywhere common—and in some years very abundant,—though rarely cultivated. Its flowers are a favorite resort of the Honey Bee; and the plant is esteemed, as affording an excellent pasture in the cooler portions of the country—though Mr. ELLIOTT speaks unfavorably of it, in the South. TORREY and GRAY consider the White Clover as indigenous, while others believe it to have been introduced from Europe. JONATHAN DICKINSON, in 1719 (*vide* Watson's Annals), writing from Pennsylvania, says, "the white clover already tinges the roads as a natural production." KALM, in 1748, spoke of it as being abundant, here. ***T. reflex'um*, L.**, (Buffalo Clover), which has ascending pubescent stems, and very large heads of red and white flowers, and the nearly related ***T. stoloniferum*, Muhl.** (Running Buffalo Clover), with long runners, are common at the West. But little is known of their agricultural value. Two introduced, annual species, are found in old fields and along road-sides; they have both yellow flowers, which are reflexed and become chestnut-brown with age, viz.: ***T. agrarium*, L.**, (Yellow or Hop Clover), which is mostly erect, with leaflets all from the same

point; *T. procumbens*, L., (Low Hop Clover), usually procumbent, the terminal leaflet petiolulate. They are worthless species,—which are gradually extending themselves from our sea-ports to the interior of the country.

3. MELILO'TUS, Tournef. MELILOT.

[Greek, *Meli*, honey, and *Lotus*; a Lotus-like plant, attractive of Bees.]

Calyx as in Clover. *Corolla* deciduous. *Legume* longer than the calyx, coriaceous, globose or ovoid, 1 – few-seeded, scarcely dehiscent. *Herbs* becoming fragrant in drying. *Flowers* mostly in long spicate racemes.

1. *M. álba*. Lam. Stem rather erect, striate; leaflets ovate-oblong, somewhat emarginately truncate at apex, mucronate, remotely dentate-serrate; racemes loose, elongated; corolla white, the standard longer than the other petals; legume ovoid-oblong, wrinkled; 1 – 2-seeded.

WHITE-FLOWERED MELILOTUS. Tree Clover. Bokhara Clover.

Fr. Le Melilot blanc. Germ. Weisser Steinklee. Span. Meliloto.

Root biennial? Stem at first ascending or oblique, finally erect, 3–5 or 6 feet high, stout, striate-ribbed, smooth, paniculately branched. Leaflets an inch to an inch and a half long; common petioles 1–2 inches long. Racemes 2–4 inches long, on axillary peduncles 1–2 inches in length. Flowers retrorsely imbricated before opening.

Introduced, and partially cultivated. Native of Europe. Fl. June–August. Fr. August–September.

Obs. This plant has been introduced by some amateur farmers, and much commended as being specially suited for *soiling* (or cutting, as wanted, for stock that are kept up); but, without any practical knowledge on my part, I cannot help doubting whether so coarse a plant can be as valuable as the common Red Clover. A former species of this genus (*M. coerulea*, Lam.)—but which has been separated, and is now the *Trigonella coerulea*, DC., a plant of strong and enduring odor—is employed, in Switzerland, to give the peculiar flavor to the famous *Schabzieger*, or (as it is usually called in the vernacular) “*Sap-sago*” Cheese. Another species with yellow flowers (*M. officinalis*, Willd.), is also found in waste places.

4. MEDICA'GO, Tournef. MEDICK.

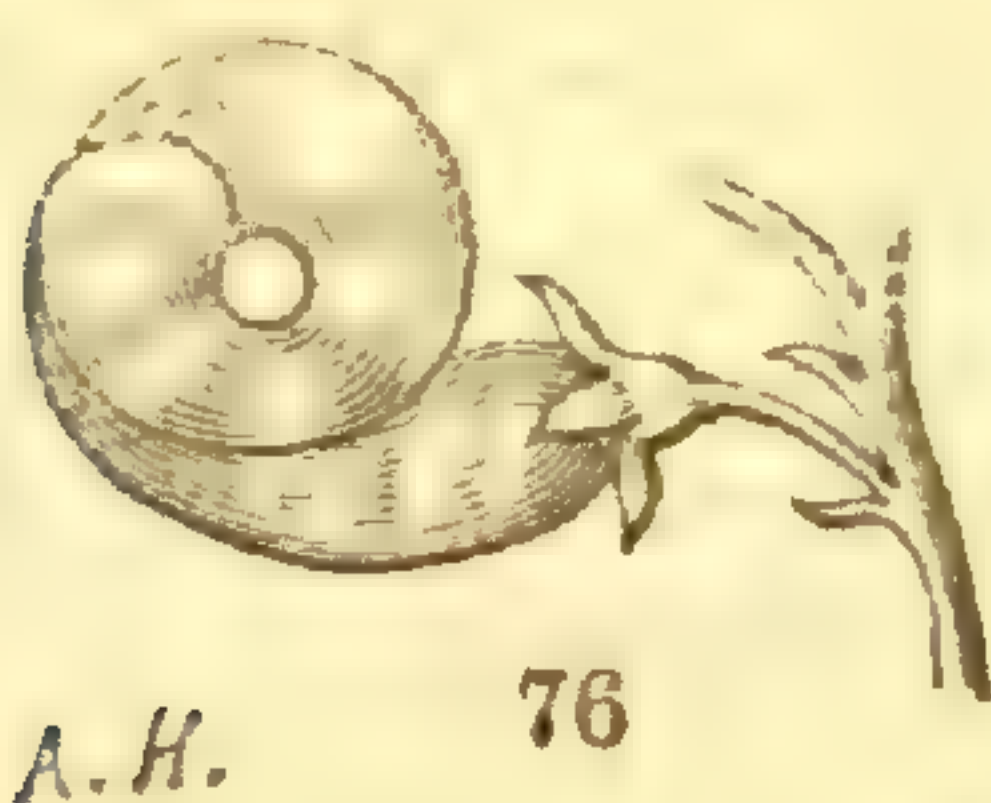
[So named by the Greeks, from having been introduced by the *Medes*.]

Flowers mostly as in Melilotus. *Legume* usually many-seeded, of various forms—always more or less falcate, or spirally coiled. *Leaves* pinnately 3-foliolate.

1. *M. sativa*, L. Stem erect; leaflets obovate-oblong, dentate; stipules lanceolate, subdentate; racemes oblong; legumes spirally twisted, finely reticulated, several-seeded.

CULTIVATED MEDICAGO. Lucerne. Spanish Trefoil. French Luzerne.

Fr. La Luzerne. Germ. Der Schneckenk'lee. Span. Alfalfa. Mielga.



Root perennial. Stem 1-2 feet high, branched, smoothish. Leaflets half an inch to an inch long—the lateral ones subsessile, the terminal one petiolulate; common petiole one-fourth to three-fourths of an inch long. Racemes erect, on peduncles half an inch to an inch long. Corolla violet-purple, nearly twice as long as the calyx.

Introduced: cultivated. Native of Spain. Fl. June-July. Fr. August.

Obs. This was formerly cultivated on a small scale, as a fodder; but it did not find favor with our farmers, and is now rarely seen in Pennsylvania. It might answer, for *soiling*, in suitable situations—though I think the stem is too ligneous and wiry to become a favorite fodder, where the red clover can be had. Its culture is successful in Northern Mexico, where it is cut several times during the season. The *Saint-foin* (*Hedysarum Onobrychis*, L., or *Onobrychis sativa*, Lam., a plant of the *Hedysarum* tribe), is much cultivated for fodder, on the calcareous soils of Europe—and the late Mr. CRAWFORD, of Georgia, interested himself in endeavoring to introduce it into the Southern States; but I do not learn that its culture was adopted to any extent. I have never met with it on any farm; and presume it scarcely belongs to the Agriculture of this country.

2. *M. lupuli'na*, L. Stem procumbent, pubescent; leaflets wedge-obovate, denticulate at the apex; flowers in short spikes, yellow; legumes reniform 1-seeded.

HOP-LIKE MEDICAGO. Black Medick. Nonesuch.

Biennial? Stem 6-12 inches long, somewhat branched, procumbent. Leaflets $\frac{1}{2}$ an inch to nearly an inch long, sometimes nearly rhomboid. Common petioles $\frac{1}{4}$ of an inch to an inch in length. Heads of flowers at first roundish, finally oblong, on slender peduncles 1-2 inches long. Legumes black at maturity.

Fields, &c. Nat. from Europe. June-Aug.

Obs. This species which, when in flower, resembles a yellow clover, is quite common in pastures in England, and is sparingly naturalized in this country. Several other species, recognized by their spirally coiled pods, are sometimes found in waste places, their seeds having been introduced in wool. *

5. ROBI'NIA, L. LOCUST-TREE.

[Name in honor of *John* and *Vespasian Robin*; French Botanists.]

Calyx short, 5-toothed, slightly 2-lipped. Vexillum large and rounded, reflexed, scarcely longer than the wings and keel. Legume compressed,

FIG. 76. A curved pod of Lucerne (*Medicago sativum*).

many-seeded, the upper or seed-bearing suture margined. *Trees or shrubs.* *Leaflets* petiolulate, stipellate; base of the *leaf-stalks* enlarged, covering the buds of the ensuing year.

1. **R. Pseud-acacia**, *L.* Branches virgate, armed with stipular prickles; leaflets oblong-ovate; racemes loose, drooping; legumes smooth.

FALSE-ACACIA ROBINIA. Locust-tree.

Stem 30–60 or 80 feet high, and 1–2 feet in diameter. *Leaflets* 3 or 4–8 or 9 pairs, 1–2 inches long, each with a small subulate *stipel* at base; *common petiole* pinnate nearly to the base, with 2 stout prickles in place of stipules. *Racemes* 3–6 inches long. *Corolla* white. *Legume* 2–3 inches long.

Mountain forests: Pennsylvania to Arkansas. *Fl.* May–June. *Fr.* September.

Obs. The Locust-tree, though generally found in the Middle and Eastern States, is only truly indigenous in the Western and Southern portions of the Union. It attains its greatest perfection in Kentucky and Tennessee, where it reaches to the height of 90 feet, with a diameter of 4 feet. The timber is one of the most valuable, whether for strength or durability; in the former quality it ranks but little below the oak, while its resistance to decay, even when exposed to the most destructive influences, exceeds that of the wood of any other of our forest-trees. It is largely employed in ship building, and is preferred to any other wood for *treenails*, as the pins are called which fasten the planks to the frame of the vessel. For posts, rail-road ties or sleepers, &c., it is invaluable. The Locust is often planted as an ornamental tree; it has a graceful habit, and is highly—even oppressively—fragrant, when in flower. The disadvantages attending its culture about dwellings are, the readiness with which its branches are broken by the winds, the many suckers its roots send up, and the numerous insects that live upon it. Indeed, so many insects prey upon this tree, that in some localities it seldom attains any great size. It is said that when the trees are planted closely, so as to form *Locust Groves*, they are much less liable to the attacks of worms than when they grow singly. Considering the value of the timber and the rapidity of its growth, even on light and poor land, the culture of the Locust is worthy of much more attention than it has yet received at the hands of our farmers. The *Clammy Locust* (*R. visco'sa*, *Vent.*) is inferior in size and value; it has the branches clothed with viscid glands, and is found on the southern borders of Virginia, and further South. The *Rose Acacia* (*R. hispida*, *L.*) is a shrub 3–8 feet high, with large rose-colored flowers. It is often cultivated, but is inclined to spread and become troublesome if not kept within bounds. *

6. WISTA'RIA, *Nutt.* WISTARIA.

[Named for *Prof. Caspar Wistar*, of the University of Pennsylvania.]

Calyx campanulate, somewhat 2-lipped; the upper lip of 2 short teeth; the lower of 3 longer ones. *Standard* large, with 2 callosities at base; *keel* scythe-shaped; *wings* with one or two auricles at base. *Pod* stipitate, elongated, nearly terete, knobby, many-seeded. *Twining shrubs*

with unequally pinnate leaves of 9 – 13 leaflets, and minute stipules, with lilac-colored flowers in large racemes.

1. *W. frutescens*, DC. Wings of the corolla 2-auricled at base; ovary glabrous.

Virginia, South and West. May.

WOODY WISTARIA. Glycine. Carolina Kidney Bean.

2. *W. CHINENSIS*, DC. Wings of corolla 1-auricled at base; ovary hairy. Cultivated. Native of China. May.

CHINESE WISTARIA. Glycine.

Obs. These beautiful vines, the one a native of the rich alluvial soils of the southern portion of the Union, and the other from China, are eminently worthy of cultivation. They both grow readily, are quite hardy, and may be propagated with the greatest ease. The Chinese species is most generally cultivated, its flower racemes being much larger than in the native one; but the other is much darker colored, and has more fragrance. *

7. INDIGOF'ERA, L. INDIGO.

[A Latinized name; meaning a plant that produces or brings *Indigo*.]

Calyx 5-cleft; segments acute. *Vexillum* orbicular, emarginate; *keel* with a subulate spur on each side—at length often bent back elastically. *Stamens* diadelphous. *Style* filiform, glabrous. *Legume* continuous, 1- few- or many-seeded. *Seeds* truncate at both ends, often separated by cellular partitions. *Herbaceous* or *suffruticose* plants. *Leaves* various, usually odd-pinnate; *stipules* small, distinct from the petiole. *Flowers* in axillary racemes.

1. *I. TINCTORIA*, L. Stem suffruticose, erect; young branches and common petioles clothed with a cinereous pubescence; leaflets in 4 or 5 pairs, with a terminal odd one, oval or obovate-oblong, mucronate, petiolulate, somewhat pubescent beneath with whitish appressed hairs; racemes shorter than the leaves; legumes sub-terete, torulose, curved and bent downwards.

DYER'S INDIGOFERA. Indigo. Indigo-plant.

Fr. L'Indigotier. *Germ.* Die Indigopflanze. *Span.* Indigo.

Annual or *biennial*. Stem 2–3 feet high, branching. *Leaflets* half an inch to an inch in length; *common petiole* 2–3 inches long. *Racemes* 1–2 inches long. *Corolla* purplish-blue. *Legumes* numerous, half an inch to three-quarters in length, deflected on the pedicel, curved upwards.

Southern States: cultivated. Native of Asia and Africa.

Obs. This plant, so important in yielding a blue coloring matter—was formerly cultivated to a considerable extent, in Georgia, and some other portions of the South: but the supply from India, and other places abroad, seems to have curtailed that branch of Southern Agriculture,—and has probably turned the attention of the planters to a

more healthful and agreeable, if not a more profitable, employment. The indigo-plant is said to be annual, when subject to inundations,—as on the delta of the Ganges; but it is sometimes fruticose—yielding one or two ratoon crops (i. e. successive growths of suckers, or sprouts), after having been cut off. Another species—*I. ANIL*, *L.*—is said to be also cultivated at the South. It differs from the above chiefly in its flattened, even (not torulose) pods.

8. *CICER*, *Tournef.* CHICK-PEA.

[The Latin name for a species of Vetch; applied to this genus.]

Calyx somewhat gibbous at base, 5-parted; segments acuminate,—the upper ones incumbent on the vexillum. *Legume* turgid, 2-seeded. *Seeds* gibbous.

1. *C. ARIETI'NUM*, *L.* Leaves odd-pinnate; leaflets cuneate-obovate, serrate; stipules lanceolate, subdenticulate; calyx slightly gibbous,—the segments as long as the wings of the corolla.

RAM *CICER*. Coffee-pea. Chick-pea. Garavances.

Fr. Le Pois Chiche. *Germ.* Gemeine Kicher. *Span.* Garbanzo.

Whole plant canescent and glandular-pilose, the hairs secreting oxalic acid. *Root* annual. *Stem* 9–18 inches high, branching. *Leaflets* about half an inch long, in 4–6 pairs (often alternate) with a terminal odd one instead of a tendril. *Flowers* axillary, solitary, white. *Seed* gibbous, pointed—in form resembling the head of a sheep—and hence the specific name.

Gardens: cultivated. Native of Europe and the East. *Fl.* July–September. *Fr.* August–October.

Obs. This is sometimes cultivated for the seeds—which are said to be a tolerable substitute for coffee. The seeds are much used, as food for horses, &c. in India,—being very abundant (as I recollect to have seen it) in the Bazaars at Calcutta, under the name of “Gram.” This vetch is the “Hamoos Pea” which is announced as a novelty, or a great curiosity (discovered among the Arabs) in LYNCH’S Expedition to the Dead Sea; though it has been familiarly known in the gardens, throughout the civilized world, ever since the days of Tournefort—if not of Homer! So much for the penny-wise policy of sending out Exploring Expeditions unaccompanied by competent Naturalists.

9. *ARA'CHIS*, *L.* PEANUT.

[An ancient name of obscure meaning.]

Diœciously polygamous. The sterile and fertile flowers produced together in the axils; the STERILE, most numerous in the upper axils, with a slender *calyx tube*, the *limb* bilabiate, the upper lip 4-toothed, the lower entire. *Stamens* monadelphous (9 united and 1 abortive,) *ovary* minute, abortive. FERTILE FL. without calyx, corolla, or stamens. *Ovary*, on an elongating *stipe* by which it is thrust under ground, where it matures as an oblong obtuse terete *pod*, the indehiscent valves becoming thickened and somewhat woody, reticulately veined on the surface.

Seeds irregularly ovoid with very thick *cotyledons* and a straight *radicle*. *Herbs* with even-pinnate *leaves* having elongated *stipules* adnate to the petiole, the *stipe* or *peduncle* of the fertile flowers often elongating several inches before reaching the earth. (This plant properly belongs to a section of the order not included in our synopsis, and is placed here as a matter of convenience.)

1. *A. HYPOGÆA*, *L.* Stem procumbent; leaflets obovate,—the common petiole not produced into a tendril.

SUBTERRANEAN ARACHIS. Ground-nut. Pea-nut.

Fr. L'Arachide. *Germ.* Die Erd-nuss. *Span.* Mani.



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Root annual. *Stem* 9–18 inches long, prostrate or erect, branching, pilose. *Leaflets* an inch to an inch and a half long, subsessile, minutely mucronate at apex, entire and bordered by a pilose nerve; *common petioles* 1–2 inches long, channelled above, pilose. *Sterile flowers*, 1 or 2–5 or 7, in the upper axils, on long slender pedicels—the *corolla* orange-yellow.

Cultivated. Native of South America. *Fl.* July–September. *Fr.* September–October.

FIG. 77. The Pea-nut (*Arachis hypogaea*), exhibiting the manner in which the ovaries, after flowering, bury themselves in the earth, where they ripen.

Obs. The summers are rather short for this plant, in Pennsylvania, — where it is sometimes seen in gardens, as a curiosity : but, in the Southern states it is cultivated to a great extent,—and from thence our nut-merchants derive their supply. The seeds,—either raw, or roasted in the legumes—are quite a favorite with children, and others ; and large quantities of them are consumed at all public gatherings. The seeds are said, also, to yield a valuable oil.

10. FA'BA, *Tournef.* HORSE-BEAN.

[The Latin name for a *Bean* ; appropriated to this genus.]

Calyx tubular, 5-cleft,—the two upper segments shorter. *Style* bent nearly at a right angle with the ovary ; *stigma* villous. *Legume* large, coriaceous, somewhat tumid. *Seeds* oblong, subcompressed, with the hilum at one end. *Stem* erect. *Tendrils* simple and nearly obsolete.

1. *F. VULGA'RIS*, *Moench.* Leaflets 2–4, oval, mucronate ; stipules semi-sagittate, obliquely ovate.

COMMON FABIA. Horse Bean. Windsor Bean.

Fr. Fève de Marais. *Germ.* Die Sau-Bohne. *Span.* Hâba.

Root annual. *Stem* 1–2 feet high, simple, smooth. *Leaflets* 2–3 inches long, entire, smooth ; *tendrils* obsolete ; *stipules* large. *Flowers* in simple erect axillary racemes. *Corolla* white, with a large black spot on each wing. *Legume* 2–3 inches long, torulose. Gardens : cultivated. *Fl.* June–July. *Fr.* August.

Obs. This bean—originally from the shores of the Caspian Sea—is sometimes cultivated for the table,—but is not generally admired. The seeds have a strong and rather unpleasant flavor.

11. ER'VUM, *Tournef.* LENTIL.

[The Latin name for a species of Vetch or Tare.]

Calyx 5-parted ; segments lance-linear, acute, about as long as the corolla. *Style* ascending ; *stigma* glabrous. *Legume* 2–4-seeded.

1. *E. LENS*, *L.* Stem erect, branching ; leaflets elliptic oblong, somewhat pilose ; stipules obliquely ovate-lanceolate, ciliate ; peduncles axillary, 2–3-flowered ; legumes broad, short, finely reticulated, smooth, 2-seeded ; seeds lenticular.

Lentil.

Fr. La Lentille. *Germ.* Gemeine Linse. *Span.* Lenteja.

Root annual. *Stem* 6–12 inches high. *Leaflets* 3–6 or 8 pairs, half an inch long ; *tendrils* nearly simple. *Corolla* white or pale purple. *Legume* about half an inch long. *Seeds* 2, orbicular, compressed, white or tawny yellow.

Gardens : cultivated. Native of Europe. *Fl.* June–July. *Fr.* August.

Obs. This Vetch is cultivated in the old world, chiefly, I believe, as food for stock,—both herbage and seeds serving that purpose. The plant is sometimes seen in gardens here ; but it will scarcely command the attention of American agriculturists. When properly cooked, lentils are a tolerable substitute for beans ; they are much prized as food

by the Mexicans, and form the basis of the "Linsen Soup" of the Germans. It appears from Dr. J. D. HOOKER'S *Notes*, that the seeds of this plant are sometimes called "Gram," in India; but that name is believed to be more usually applied to the seeds of Cicer.

12. PISUM, *Tournef.* PEA.

[The Latin name for the common Pea.]

Calyx-segments foliaceous, the two upper ones shorter. *Vexillum* large, reflexed. *Style* compressed, keeled, villous on the upper margin. *Legume* oblong. *Seeds* numerous, globose, with an orbicular hilum.

1. *P. SATIVUM*, L. Leaflets rhomboid-ovate, rather obtuse, mucronate, entire; stipules very large, ovate, semi-sagittate, crenate-dentate at base; peduncles 2 or many-flowered; legumes subcarnose.

CULTIVATED PISUM. Pea. Garden-pea.

Fr. Pois cultivé. *Germ.* Gemeine Erbse. *Span.* Guisante.

Plant smooth and glaucous. *Root* annual. *Stem* 1-3 or 4 feet long; flaccid, climbing by tendrils. *Leaflets* usually 2 pairs, 1-2 or 3 inches long; *tendrils* long and branching; *stipules* larger than the leaflets. *Peduncles* axillary, 1 or 2-6 inches long, often with two flowers at summit. *Corolla* white. *Style* reflexed. *Legume* about two inches long, subterete.

Gardens and lots: cultivated. Native country unknown. *Fl.* June-July. *Fr.* July-August.

Obs. Several varieties of this are cultivated (one or more of them in almost every garden), chiefly for the young seeds, or "green peas," which afford a favorite dish at table. In the Northern states, the field culture of Peas (for the mature seeds,) is much attended to; but it is rarely seen in Pennsylvania—or, I believe, south of that. The Sweet Pea and the Everlasting Pea, cultivated for ornament, belong to the genus *Lathyrus* of the same tribe.

13. VICIA, *Tournef.* VETCH.

[The ancient Latin name for Vetch or Tare.]

Calyx 5-cleft, or 5-toothed, the two upper teeth shorter. *Style* filiform, bent; *stigma* villous. *Legume* oblong, mostly many-seeded. *Seeds* with the *hilum* lateral.

1. *V. SATIVA*, L. Annual; stem simple; leaflets 5-7 pairs, obovate-oblong to linear, retuse, mucronate; flowers mostly in pairs, nearly sessile.

CULTIVATED VICIA. Common Vetch. Tare.

Stem 1-3 feet long, procumbent or climbing by tendrils. *Leaflets* $\frac{3}{4}$ of an inch to an inch and a half in length. *Flowers* violet purple, axillary.

Cultivated grounds. Native of Europe. June-August.

Obs. This species was formerly much cultivated, and seems still to be highly prized, in Europe, as a fodder for cattle; but in this country it is regarded as a mere weed.

14. PHASEOLUS, L. BEAN.

[The ancient name of the Kidney Bean.]

Calyx somewhat bilabiate,—the upper lid bifid or emarginate, the lower one trifid. *Keel* (of the corolla) together with the *stamens* and *style*, spirally twisted or incurved. *Ovary* stipitate, the stipe sheathed. *Legume* linear or falcate, compressed or subterete, tipped with the base of the style, many-seeded. *Seeds* reniform, with an oval-oblong *hilum*. *Leaves* trifoliate.

1. *P. VULGARIS*, Savi. Stem mostly voluble; leaflets ovate acuminate; racemes solitary, pedunculate; bracts as long as the calyx; legumes nearly linear and straight, long-mucronate; seeds reniform.

COMMON PHASEOLUS. Kidney Bean. String Bean. Pole Bean.
Fr. Haricot. Germ. Gemeine Bohne. Span. Fasoles.

Root annual. *Stem* 4–6 or 8 feet long, slender, voluble and climbing (always twining, against the sun—W. S. E.)—or short and erect (in the bunch variety). *Leaflets* 2–4 or 5 inches long; *common petioles* 1–5 or 6 inches long. *Racemes* on stout peduncles 1–3 or 4 inches long. *Corolla* mostly white. *Legume* 3–6 inches long. *Seeds* more or less reniform, whitish, or of various colors.

Gardens and lots: cultivated. Native of India. *Fl.* June–August. *Fr.* September.

Obs. Very generally cultivated for the table,—both seeds and legumes being eaten while young; when mature, the seeds only. The “baked beans” of New England, constitute a sort of national dish among the descendants of the Pilgrims.

The *P. NANUS*, L. Dwarf or Bunch Bean (with a short erect stem, more acuminate leaflets, and larger bracts), is supposed to be only one of the many varieties produced by long culture.

2. *P. LUNATUS*, L. Stem voluble, smoothish; leaflets obliquely- or deltoid-ovate, acute; racemes subpedunculate; bracts shorter than the calyx; legumes broad, compressed, scymitar-form or somewhat lunate; seeds much compressed, broad.

LUNATE PHASEOLUS. Lima Bean. Carolina Bean.

Root annual. *Stem* 6–8 or 10 feet long, branching, slender, voluble and climbing. *Leaflets* 2–4 inches long; *common petioles* 2–6 inches long. *Racemes* loose flowered, on peduncles about two-thirds of an inch long. *Corolla* greenish-white, rather small. *Legumes* 2–3 inches long, and about an inch wide. *Seeds* few, large, flattish and mostly white.

Gardens and lots: cultivated. *Fl.* July–August. *Fr.* September–October.

Obs. This species (supposed to be a native of Bengal—though generally named as if of South America,) affords a favorite dish, in the latter part of summer,—the large seeds only being used. Both species are tender plants, impatient of cold, and killed by the slightest frost.

15. BAPTIS'IA, Vent. FALSE INDIGO.

[Greek, *Baptizō*, to dip, or dye: from its coloring properties.]

Calyx 4–5-toothed. *Petals* nearly equal,—the keel-petals slightly connected. *Stamens* 10, distinct. *Legume* ventricose, stipitate in the persistent calyx, many-seeded. *Herbs*; leaves mostly trifoliate, turning bluish-black in drying.

1. B. tinctoria, R. Brown. Bushy; smooth, and rather glaucous; leaflets cuneate-obovate; stipules subulate, deciduous; racemes terminal, few-flowered.

DYER'S BAPTISIA. Wild Indigo. Horse-fly Weed. Rattle Bush.

Perennial. Stem about 2 feet high, much branched. Leaflets half an inch to an inch long; common petioles 1 line to $\frac{1}{4}$ of an inch in length. Flowers yellow; calyx 4-toothed—the 2 upper segments being united. Legumes about half an inch long, inflated, conspicuously stipitate.

Dry hills and woodlands: common. June—September.

Obs. The Wild Indigo, which is introduced here on account of its reputed medicinal qualities, is conspicuous when in flower, especially in sandy woods and fields. It is said that a coarse kind of Indigo can be prepared from its leaves, but we know of no reliable experiments upon this point. Medicinally, it is said to possess emetic and purgative properties, and has been used externally as an application in foul ulcers. It is often used to drive flies away from horses, being attached to their harness, hence one of the common names; it is probable that its efficacy in this case, if there be any, is wholly mechanical, and not due to any peculiar property of the plant. Several other species are found in the South and West; among these is **B. australis, R. Brown**, which is often cultivated,—it is 4–5 feet high, with large racemes, 1–2 feet long,—of handsome blue flowers. *

16. CER'CIS, L. RED-BUD.

[Greek, *Kerkis*, a weaver's shuttle; from the form of the legume.]

Calyx 5-toothed, *Corolla* scarcely papilionaceous; petals all distinct, unguiculate,—the vexillum smaller than the wings, and the keel-petals larger. *Stamens* unequal. *Legume* oblong, acute at each end, much compressed, 1-celled, many-seeded,—the upper suture margined, seeds obovate; *radicle* straight. Small trees, with simple entire leaves, and membranaceous caducous stipules. *Flowers* fasciculate along the branches, appearing before the leaves.

1. C. Canadensis, L. Leaves orbicular-cordate, acuminate, villous in the axils of the nerves beneath.

CANADIAN CERCIS. Red-bud. Judas-tree.

Stem 15–20 or 30 feet high and 6–12 inches in diameter, with somewhat geniculate branches. *Leaves* 3–4 inches long; *petioles* 1–2 inches long. *Flowers* bright purple, acid, on filiform *pedicels* which are clustered (4–6 or 8 from a bud) on the naked branches. *Legumes* about three inches long, subcoriaceous, smooth.

Banks of streams: Canada to Louisiana. *Fl.* April. *Fr.* June.

Obs. This little tree is admired, in early spring, for its clusters of small flowers, which clothe the branches, and even the trunk, in purple, before the leaves appear. Although not of agricultural importance, it deserves to be known, and to have a place among ornamental shrubbery and trees, around the mansion of the tasteful farmer.

17. CAS'SIA, L. SENNA.

[An ancient name of obscure derivation.]

Flowers perfect; *Sepals* 5, scarcely connected. *Petals* 5, unequal, spreading, not papilionaceous. *Stamens* mostly 10, some of them often imperfect; *anthers* opening at apex. *Herbs*: *leaves* equally pinnate, with a gland near the base of the petiole.

* *Leaflets* large; *stipules* deciduous: the lower *anthers* fertile, the 3 upper ones deformed and sterile.



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1 C. Marilan'dica, L. Perennial; stem erect, leaflets 6–9 pairs, ovate oblong; petiole with a club-shaped gland near the base; racemes axillary, the upper ones somewhat paniculate; legumes at first hairy, at length smooth.

MARYLAND CASSIA. Wild, or American Senna.

Stem 3–4 feet high, rather stout, branching. *Leaflets* 1–2 inches long, petiolulate, *common petioles* 1–2 inches in length below the leaflets, with an obovoid subsessile gland on the upper side. *Racemes* pedunculate, those in the upper axils forming a sort of terminal leafy panicle; *flowers* yellow, often becoming a dead white. *Legumes* 3–4 inches long, villous when young, compressed, somewhat curved, often sinuate on the edges from partial contractions; *seeds* ovate-oblong, separated by a kind of transverse partitions.

Low grounds along streams: frequent. August–October.

Obs. This very showy species is found in most parts of the United States; its leaves possess properties similar to those of the imported Senna of the shops—which is also furnished by several species of the ge-

FIG. 78. Wild Senna (*Cassia Marilandica*), a short raceme in the axil of an abruptly-pinnate leaf.

nus Cassia. While some writers state, that it requires a third larger dose than the imported senna, to produce the same effect, others claim for it an equal rank as a purgative. It is cultivated to considerable extent by the "Shakers," and though it has not received the general attention at the hands of the medical profession that it deserves, it is frequently used in domestic and country practice. The leaves should be collected when the fruit is ripe, the active principle being then more fully developed than at the flowering time. *

2. *C. occidentalis*, L. Leaflets 4–6 pairs, ovate lanceolate acute; gland ovate; pods elongated-linear, smooth.

WESTERN CASSIA. Styptic Weed.

Perennial. Stem 4–6 feet high. Leaflets serrate-ciliolate. Flowers large, yellow. Legume somewhat coriaceous, about 5 inches long, with a tumid border; 20–30-seeded.

Near buildings: Virginia to Louisiana. July–October.

Obs. This plant, which is very common at the South, is believed to be introduced from Tropical America, where it has some medicinal reputation. The root is said to be diuretic, and the leaves are used as a dressing to slight sores. *

** *Leaflets small, somewhat sensitive to the touch: stipules persistent; petiolar gland cup-shaped; anthers all perfect.*

3. *C. Chamæcris'ta*, L. Stems spreading; leaflets 8–15 pairs, linear oblong; flowers large and showy; stamens 10, unequal.

Partridge Pea. Sensitive Pea. Magothy-bay Bean.

Stem 1–2 feet high, firm and somewhat woody at base, much branched, often purplish. Leaflets half an inch to near an inch long, minutely ciliate serrulate, subsessile; common petioles about one-third of an inch in length below the leaflets, with a depressed or cup-like gland on the upper side. Flowers deep bright yellow (usually with purple spots at base), in lateral subsessile fascicles above the axils of the leaves—often in pairs, sometimes 3–4. Legume about 2 inches long, hairy along the sutures.

Sandy fields: common, especially southward. July–September.

Obs. In a paper read before the American Philosophical Society, May 2, 1788, and published in the 3d volume of their Transactions, Dr. Greenway of Virginia, speaks favorably of this plant as a means of recruiting worn out lands, by its decomposition in the soil,—though he considers the common corn-field Pea as preferable; and I have no doubt that the Red Clover (*Trifolium pratense*), properly managed, is more eligible than either.

18. GYMNO'CLADUS, Lam. KENTUCKY COFFEE-TREE.

[Greek, *Gymnos*, naked, and *Klados*, a branch; in reference to its stout naked branches.]

Flowers dioecious, regular. *Calyx* tubular, 5-cleft. *Petals* 5, equal, oblong, inserted on the calyx-tube. *Stamens* 10, distinct, inserted with the petals. *Legume* oblong, flat, the valves thick and woody, pulpy within. A tree with the young branches clumsily thick; leaves odd-bipinnate.

1. *G. Canaden'sis*, *Lam.* Leaflets 7–13 on the subdivisions, ovate, petiolulate,—the lowest a single pair; flowers in axillary racemes.

CANADIAN GYMNOCLADUS. Kentucky Coffee-tree. Kentucky Mahogany.

Stem 50–80 feet high, branching. *Leaves* 2–3 feet long, bipinnately branching; *leaflets* rather alternate, entire, about 3 inches in length. *Flowers* greenish white. *Legumes* 6–10 inches long, and 1–2 inches wide, somewhat falcate; *seeds* nearly orbicular, a little compressed, over half an inch in diameter.

Rich woods: W. New York to Illinois and south-westward; also in cultivation. *Fl.* May. *Fr.* October.

Obs. This fine tree has been introduced into the Eastern States, from the West; and although not equal to some others, as a shade tree, is worthy of a place in all ornamental plantations. The timber is valuable, possessing a fine and close grain; qualities which adapt it to the use of the cabinet-maker.

19. GLEDIT'SCHIA, *L.* HONEY LOCUST.

[Named in honor of *John Gottlieb Gleditsch*, a German Botanist.]

Flowers polygamous. *Sepals* 3–5, equal, united at base. *Petals* as many as the sepals,—or fewer by abortion—or by the union of the two lower ones. *Stamens* as many as the sepals and opposite them, or by abortion fewer. *Legume* stipitate, often intercepted internally between the seeds, dry or with sweet pulp around the seeds. *Seeds* oval. *Trees*: the super-axillary branchlets often converted into simple or branched spines. *Leaves* even-pinnate or bipinnate (often both forms on the same tree.) *Flowers* small, somewhat spicate.

1. *G. triacan'thos*, *L.* Spines stout, mostly triple; leaflets linear or lance-oblong, somewhat serrate; legumes oblong, much compressed, somewhat falcate and undulate, many-seeded,—the intervals filled with sweet pulp.

THREE-THORNED GLEDITSCHIA. Honey-locust. Three-thorned Acacia.
Fr. Le Fevier á trois Epines. *Germ.* Der Honigdorn.

Stem 30–50 or 60 feet high, and 2–3 or 4 feet in diameter. *Leaflets* about an inch or an inch and a half long. *Flowers* yellowish green. *Legumes* 6–12 or 15 inches long, and an inch or more in width, thin and wavy, or somewhat twisted.

Pennsylvania to Louisiana: often cultivated. *Fl.* July. *Fr.* September–October.

Obs. The light foliage of this tree gives it a pleasing aspect, but it is not a good shade tree. It is in frequent cultivation as an ornamental tree, and seems to be nearly naturalized around New-York. It has been used with success in some localities for hedging, its formidable thorns compensating, by their utility, for the beauty which a hedge with such light foliage must lack. The thorns are knocked off by the winds and, being often so compound that however they may lie, some points will stick up, prove very troublesome by wounding the feet of cattle.

ORDER XXVI. ROSACEÆ. (ROSE FAMILY.)

Trees, shrubs or herbs with alternate stipulate leaves, and regular flowers having a calyx of 5 (rarely 3-4 or 8) sepals more or less united, often with as many bracts, and petals as many as the sepals, inserted with the numerous (rarely few) stamens on the calyx. Pistils 1-many, free, or (in the Pear tribe) united within the calyx-tube. Seeds 1-few in each ovary, without albumen; radicle straight.

This Order—comprising about sixty genera—is remarkable for the amount and variety of its esculent products. Many of the fruits are valuable, and some of them eminently delicious, while the type of the Order (*Rosa*) is by universal consent regarded as the queen of beauty among flowers. A few of the drupaceous species of the Order contain a dangerous quantity of Prussic Acid, in the nuts and leaves; but the fleshy or succulent fruits are, almost without exception, innocent and wholesome.

1. THE ALMOND SUB-FAMILY.

Ovaries solitary, free from the deciduous calyx. Style terminal. Fruit a drupe (stone-fruit). Trees or shrubs; the bark exuding gum; the bark, leaves and kernels possessing the peculiar flavor of prussic acid. Stipules free.

Stone of the fruit rough. Petals rose-color.

Stone of the fruit smooth. Petals white.

Stone flattened, with grooved edges. Skin of fruit downy.

Stone more or less flattened, generally margined.

Fruit with a bloom.

Stone roundish or globular. Fruit without a bloom.

1. *PERSICA*.

2. *ARMENIACA*.

3. *PRUNUS*. § 1.

3. *PRUNUS*. § 2 & 3

2. THE ROSE SUB-FAMILY.

Ovaries many or few, separate from each other and from the calyx, but sometimes enclosed by and concealed in its tube. Styles lateral or terminal. Fruit either follicles or little drupes. Herbs or shrubs, rarely trees, with simple or compound leaves. Stipules usually united with the petiole.

Pistils 5, forming follicles in fruit. Calyx 5-cleft. Styles terminal.

Pistils numerous, forming in fruit dry akenes, tipped with the feathery persistent style. Calyx bracteolate, open.

Pistils numerous. Styles often lateral, deciduous; fruit of dry akenes. Calyx bracteolate, open.

Receptacle of the fruit dry and small.

Receptacle of the fruit becoming large and pulpy, edible.

Pistils numerous. Styles terminal, deciduous; ovaries becoming little drupes, cohering with one another or with the receptacle. Calyx open, not bracteolate.

Pistils numerous, akenes long, enclosed in the tube of the urn-shaped calyx.

4. *SPIRÆA*.

5. *GEUM*.

6. *POTENTILLA*.

7. *FRAGARIA*.

8. *RUBUS*.

9. *ROSA*.

3. PEAR SUB-FAMILY.

Calyx-tube fleshy in fruit, forming a pome. Pistils 2-5, their styles more or less separate, their ovaries united with each other and with the tube of the calyx.

Cells of the fruit 1-2-seeded. Fruit drupe-like, containing 2-5 stones.

Leaves simple.

Fruit with 3-5 parchment-like carpels. Leaves pinnate. Fruit berry-like, scarlet.

Leaves simple.

Fruit tapering to the stalk.

Fruit sunk in at both ends.

Cells of the fruit many-seeded, parchment-like, enveloped in mucilage.

10. *CRATÆGUS*.

11. *PYRUS*. § 3.

11. *PYRUS*. § 1.

11. *PYRUS*. § 2.

12. *CYDONIA*.

1. *PER'SICA*, Tournef. PEACH.

[A name derived from *Persia*, its native country.]

Calyx tubular, with 5 spreading segments. *Drupe* oval, tomentose or

smooth, the fleshy and succulent pulp adherent or separable from the rugosely furrowed *nut*. Small trees. Leaves lanceolate, serrate, conduplicate in vernation. Flowers subsessile, solitary or in pairs, preceding the leaves.

1. *P. VULGAR'IS*, Mill. Fruit densely tomentose.

COMMON PERSICA. Peach. Peach-tree.

Fr. Le Pêcher. Germ. Der Pfirschenbaum. Span. El Melocotón.

Stem 8-12 or 15 feet high, branching. Leaves 3-5 inches long; petioles half an inch long, channeled above and glandular near the leaf. Petals pale red or purplish. *Drupe* with the flesh white, yellow or reddish, either adhering to the nut, and then called *Cling-stone*, or separable from it—when it is termed *Freestone*.

Cultivated. Native of Persia. Fl. April. Fr. Aug. - Sept.

Obs. The fruit of this tree, like most of those which have had the advantage of long and careful culture, presents numerous varieties, the best of which have been perpetuated under distinctive names by the nurserymen; such as "George the 4th," "Morris White," &c. These kinds, the number of which is rather formidable, will be found described in standard works upon Horticulture, and in fruit growers' Catalogues. Although the tree is short-lived, its culture is managed with great spirit and success in the Middle States, particularly in Maryland, Delaware, and New Jersey; and latterly, with the facilities afforded by steamers, our northern cities are supplied, early in the season, from as far south as Georgia. The most approved varieties are perpetuated by raising young stocks from the seeds, and inserting upon them the buds or scions of the desirable kinds.

This process, for changing the character of seedling trees, is alluded to by the great English Bard with his usual felicity:

" — You see, — we marry
A gentler scion to the wildest stock,
And make conceive a bark of baser kind,
By bud of nobler race: This is an art
Which does mend nature—change it rather; but
The art itself is nature."—*Winter's Tale*, Act. 4.

Var. *LA'VIS*. Fruit smooth.

Nectarine.

The Nectarine, which was formerly considered as a distinct species, is now regarded as only a very marked variety of the Peach, from which it differs only in its smooth fruit, which presents the same varieties of *cling-stone* and *free-stone*. Cases are recorded, in which the same tree has produced both Peaches and Nectarines.

The Almond (*Amygdalus communis*, L., which is nearly related to the Peach—except that the drupe is dry and fibrous, instead of succulent, and the seed is the eatable portion), has not yet, I believe, been much cultivated within the U. States: but it may probably be successfully introduced into Florida, and perhaps some other southern States, it having succeeded even in Pennsylvania.

A dwarf variety, with the flowers all double and sterile, is well known

as an ornamental shrub in gardens, as the Flowering Almond. There are two marked varieties of the Almond: the one with sweet bland seeds, Sweet Almond; and the Bitter Almond, the kernel of which contains a bitter volatile oil impregnated with prussic acid. This oil, which is often used for flavoring pastry, &c., exists, or one very nearly like it, in the peach kernel. Judging from observation, it would not seem to be generally known to our Pastry Cooks, that a peach pie baked with the fruit whole (i. e. simply pared, but *the nut left in the peach*), is vastly superior to one made of the mere fleshy portion cut in pieces. The process of baking, as I suppose, elicits the essential oil from the seed of the peach and diffuses it through the pulp, imparting to it a sprightly and delicious flavor, far beyond what it possesses when the stone is previously rejected.

2. ARMENIA'CA, *Tournef.* APRICOT.

[A name derived from *Armenia*, its native country.]

Calyx campanulate, with 5 reflexed segments. *Drupe* roundish-oval, fleshy, clothed with a soft velvety pubescence; *nut* compressed, the surface even and not roughly furrowed; one margin obtuse, the other acute, both grooved. Small trees. *Leaves* subcordate or ovate, convolute in the bud. *Flowers* white, subsessile, solitary or few, preceding the leaves.

1. *A. VULGA'RIS*, *Lam.* Leaves orbicular-ovate, acuminate, dentate, subcordate at base; flowers sessile.

COMMON ARMENIACA. Common Apricot. Moor-park Apricot.

Fr. L'Abricotier. *Germ.* Der Aprikosenbaum. *Span.* Albaricoque.

Stem 10 - 15 or 20 feet high, with rather stout spreading branches. *Leaves* 2 - 3 inches long; *petioles* an inch to an inch and a half long, mostly with cup-like glands near the base of the leaf. *Petals* white. *Drupe* oval, yellowish when mature.

Cultivated. Native of Armenia. *Fl.* April. *Fr.* July.

Obs. This tree yields a luscious and favorite fruit; and, in propitious seasons, the branches are so loaded as to remind one of the admonitory passage in SHAKSPEARE:

"Go, bind thou up yon' dangling Apricocks,
Which, like unruly children, make their sire
Stoop with oppression of their prodigal weight:
Give some supportance to the bending twigs."

King Richard II

The name of this fruit in SHAKSPEARE'S time was written "*Apricocks*," perhaps by a corruption of the latin *A. præcox*, meaning *Early Armeniaca*. It is melancholy to reflect how thoughtless and negligent mankind generally are, with respect to providing fruit for themselves. There are few persons who do not own or occupy sufficient ground to admit of 3 or 4 choice fruit-trees and a grape-vine; such, for example, as an Apricot, a Peach, a May-duke Cherry, a Catharine Pear, and a Catawba grape; yet the great majority seem never to think of planting such trees, while

they are ready enough to run after the rare fruit which some provident neighbor may have taken the pains to cultivate. It is high time that such disreputable negligence should cease, and that people should be more attentive to duties which are enjoined by every consideration of comfort and good taste—nay, even of sheer justice to those around them, who are now annually plundered of the fruits of their own care and labors.

2. *A. DASYCAR'PA*, Pers. Leaves ovate or oval, somewhat acuminate, doubly serrate; flowers pedicellate.

HAIRY-FRUITED ARMENIACA. Black Apricot.

Stem 10–15 feet high; branches rather slender and virgate. *Leaves* $1\frac{1}{2}$ to near 3 inches long; *petioles* about an inch long. *Petals* white. *Drupe* subglobose, hairy, dark purplish color when mature.

Cultivated. Native country unknown. *Fl.* April. *Fr.* July.

Obs. This species has more of the habit of a *Prunus*, or Plum-tree, than the preceding, and is reputed to be a more certain fruit-bearer; but I have not found it so. It flowers freely; but the young fruit is soon stung by an insect, and nearly all falls off before it is half grown.

3. PRU'NUS, L. PLUM AND CHERRY.

[The Latin name for the Plum.]

Calyx 5-cleft. *Petals* 5, spreading. *Stamens* 15–30. *Ovary* with 2 pendulous ovules. *Drupe* fleshy; stone smooth and even. Small trees or shrubs. *Flowers* usually white.

[The Plum and Cherry are in most works considered as distinct genera; we follow Dr. Gray and other recent authorities in arranging them as sections of the genus *Prunus* of Linnaeus.]

§ 1. *PRUNUS*, Tourn. (PLUM.) *Drupe* usually with a bloom; the stone flattened, or at least wider than thick; leaves convolute in the bud; flowers more or less preceding the leaves, from lateral buds; the pedicels few or several, in simple umbellate clusters.

* Introduced or cultivated species.

1. *P. SPINO'SA*, L. Branches thorny; leaves obovate oblong or ovate-lanceolate, sharply serrate, at length glabrous; pedicels glabrous; fruit small, globular, black with a bloom, the stone turgid acute on one edge. Sloe. Black Thorn.

Var. insiti'tia. Less spiny, the lateral branches often ending in a thorn; pedicels and lower side of the leaves pubescent; fruit round and black. Bullace Plum.

Waste places. E. New England, &c.

Var. DOMES'TICA. Branches unarmed; leaves lance-ovate or oval, mostly acute, serrate; pedicels sub-solitary.

Common Plum. Damascene, Gage, &c.

Fr. Prunier. *Germ.* Der Pflaumenbaum. *Span.* Ciruelo.

Stem 8–12 or 15 feet high, branching. *Leaves* 1–3 inches long; *petioles* half an inch to an

inch or more in length. *Flowers* rather preceding the leaves, solitary or in pairs; *pedicels* about half an inch long. *Petals* white. *Drupe* oval, ovoid or obovoid, of various colors, from black to pale greenish-yellow, covered with bloom, the flesh rather firm.

Cultivated. *Fl.* April. *Fr.* August.

Obs. Numerous forms of this are cultivated,—some of them of a large size; but the depredations of insects render the fruit an uncertain crop—at least in the country. In cities, the insects seem to be less destructive. The Sloe is used in Europe for hedges, and is said to be naturalized in some parts of the United States; it is now considered as the original of the numerous varieties of cultivated plum and of the Bullace Plum.

**** Indigenous species.**

2. *P. America'na*, Marsh. Branches subspinoso; leaves oval and obovate, conspicuously acuminate, sharply and often doubly serrate, very veiny, smooth when old; umbels subsessile, 2–5-flowered; fruit roundish, oval, yellow, orange or red, nearly destitute of bloom; the turgid stone more or less acute on both margins.

AMERICAN PRUNUS. Red Plum. Yellow Plum.

Stem 8–12 or 15 feet high, much branched,—the young branches virgate, the old ones rugged and somewhat thorny. *Leaves* 2–3 inches long; *petioles* one fourth to half an inch long. *Flowers* preceding the leaves in numerous fascicles of threes or fours; *pedicels* one third to half an inch long. *Petals* white. *Drupe* mostly reddish orange-colored, with a rich succulent yellow pulp, and a thick tough skin.

Thickets, fence-rows and banks of streams. Canada to Texas. *Fl.* April. *Fr.* August.

Obs. This Plum—about which foreign Botanists have been so bewildered—is extensively diffused through our country. In its wild state, the flowers are apt to be abortive,—and the fruit is small and rather acerb; but by long culture, the drupe sometimes becomes as large as a common Apricot. Although of a pleasant flavor, when fully mature, it is not adapted to culinary purposes.

3. *P. mari'tima*, Wang. Seldom thorny; leaves ovate or oval, finely serrate, softly pubescent underneath; pedicels short, pubescent; fruit globular, purple or crimson, with a bloom.

Beach Plum. Sand Plum.

A low straggling *shrub* 2–5 feet high. *Leaves* 2–3 inches long, rather stiff, smooth above, and downy, especially on the mid-rib and veins, beneath. *Flowers* in umbels of 2–6; *pedicels* $\frac{1}{2}$ an inch long; *calyx* pubescent. *Fruit* $\frac{1}{2}$ an inch to an inch in diameter; *stone* very turgid, acute on one edge, rounded and minutely grooved on the other.

Near the sea: Massachusetts to Virginia. *Fl.* May. *Fr.* Aug. – Sept.

Obs. This species is found along the sea-coast and often extends inland for twenty miles or more. When growing at a distance from the sea, its leaves are smoother and thinner and the fruit smaller,—forms which have been considered as distinct varieties or even species. The bush grows in little thickets and is in exposed situations nearly prostrate. The fruit varies in quality, often, when fully ripe, of an agreeable flavor; it is much used for preserving along the New England coast and is sometimes sold in the markets. *

4. *P. Chica'sa*, Mx. Branches subspinoso; leaves narrow, oblong

lanceolate or oblanceolate, acute, finely serrulate with glandular-pointed teeth; umbels sessile, 2-3-flowered; fruit globular, red; the stone ovoid, almost as thick as wide, rounded at both sutures, one of them minutely grooved.

CHICASA PRUNUS. Chickasaw Plum. Mountain Cherry.

Stem 6-10 or 12 feet high, much branched, the young branches virgate, dark purple, smooth and shining, the old ones crooked or geniculate, and somewhat thorny. *Leaves* 1-2 inches long, smooth; *petioles* slender, one fourth to three-fourths of an inch long. *Flowers* appearing with the leaves, in sessile fascicles of threes; *pedicels* about half an inch long, slender and smooth. *Drupe* globose, red or yellowish-red, nearly or quite destitute of bloom, with a tender pulp and a thin skin.

Cultivated. *Fl.* April. *Fr.* July.

Obs. This little tree (which is believed to be a native of our South-western territory,—where it is a small shrub, in its wild state,—) by long culture produces a very pleasant fruit. When we consider the great difficulty attending the culture of the common plum, on account of the attacks of the *curculio*, it would seem that this and the other na-



tive species should receive more attention from our horticulturists than has yet been bestowed upon them. It approaches the Cherry, in character and appearance, and may be considered as a connecting link between the Plum & Cherry.

2. CERASUS, (CHERRY). *Fruit* destitute of bloom; the stone globular and marginless; leaves folded (conduplicate) in the bud; flowers in umbellate clusters.

5. *P. A'VIVUM*, L. Branches erect or ascending, rather stout; leaves.

FIG. 79. A flower of the common Garden Cherry (*Prunus avium*). 80. A divided flower with its solitary pistil free from the calyx. 81. The fruit (drupe) divided to show the hardened inner portion of the fruit (stone) containing the seed.

oval or obovate-oblong, acuminate, coarsely serrate, pilose and somewhat glaucous beneath; umbels sessile; flowers scarcely preceding the leaves; pedicels rather long; drupe roundish ovoid or subcordate at base.

BIRDS' PRUNUS. English Cherry. Bleeding-heart, &c.

Fr. Le Cerisier. Germ. Der Kirschbaum. Span. Cerézo.

Stem 30–60 feet or more in height, and often 2–3 feet in diameter at base, branching regularly, and somewhat verticillately, so as to form an oblong conical top. *Leaves* 3–5 or 6 inches long; *petioles* an inch to an inch and a half long. *Pedicels* slender, an inch to an inch and a half long, usually 3 (often 2) in a fascicle. *Petals* white. *Drupe*s of various size and color, tender and often very succulent, sweet or bitterish-sweet.

Cultivated. *Fl.* April *Fr.* June–July.

Obs. Cherries are said to have been originally brought to Rome from Cerasus, a city of Pontus, by the Roman Consul and General, LUCULLUS, some 60 or 70 years before the Christian era; and from Rome they have been distributed over the rest of the civilized world. Our cultivated Cherry trees seem obviously to consist of at least two original species,—viz. the sweet “English Cherry,” so called,—and the common Sour Cherry. The numerous varieties—produced by culture (and possibly some hybrids)—may be all referred to one or the other of those two. There are, undoubtedly, several very distinct sorts of fruit; but I incline to think the general habit and aspect of the trees commonly seen in this country, warrant the reduction of them all to the two above referred to; and I shall so consider them in this work.

6. *P. CE'RASUS, L.* Branches spreading, slender and flexible; leaves obovate and ovate-lanceolate, mostly narrowed at base, acuminate or acute, serrate, smoothish; umbels subsessile; flowers rather preceding the leaves; pedicels rather short; drupe globose.

Red or Sour Cherry, Morello Cherry, &c.

Stem 10–20 feet high, irregularly branched; branches rather slender and flaccid, spreading nearly horizontally, and forming a roundish bushy top. *Leaves* $1\frac{1}{2}$ –3 inches long; *petioles* half an inch to an inch long. *Pedicels* half an inch to an inch in length, 2, or more frequently 3, in a fascicle. *Petals* white. *Drupe*s fleshy, more or less acid, red or dark purple when mature.

Cultivated. *Fl.* April. *Fr.* July.

Obs. The “Sour Cherry” is the most common and, for culinary purposes, the most valuable of the genus. The Morello Cherry is a remarkably fine variety, with a rich purple juice,—and in the days of “Cherry Bounce,” was a great favorite: but, for the last 30 years it has almost entirely disappeared from Pennsylvania, in consequence of the ravages of an insect, causing large warty excrescences on the branches of the tree. The fruit first failed,—and since, the tree itself has become very scarce. *P. Pennsylvanica, L.*, the wild Red Cherry, is a native tree belonging to this section, its fruit small, sour and worthless.

§ 3. *PADUS, (CHERRY.)* Fruit as in preceding section; flowers in racemes terminating the branches, developed after the flowers.

7. *P. Virginia'na*, L. Leaves oval, oblong or obovate, abruptly acuminate, sharply and often doubly serrate; fruit red, turning to dark crimson.

VIRGINIAN PRUNUS. Choke Cherry.

A tall *shrub*. Leaves 2-4 inches long, thinnish. Flowers in simple racemes 2-3 inches in length; petals roundish. Fruit about the size of a pea, very austere and astringent until perfectly ripe.

River banks: most common northward. *Fl.* May. *Fr.* August.

Obs. Doct. Gray found from the examination of the original specimens in the Linnæan Herbarium that this is the true *P. Virginiana*, a name which had been previously applied to the following species.

8. *P. sero'tina*, Ehrhart. Leaves oblong, or lance-oblong, acuminate, smooth, shining above, finely serrate with appressed or incurved callous teeth; racemes elongated; drupes globose, small, purplish-black.

LATE PRUNUS. Wild Cherry. Black Cherry.

Stem 40-60 or 80 feet high, and 2-3 feet in diameter at base, with large irregular spreading branches. Leaves 2-4 or 5 inches long, subcoriaceous; petioles half an inch to three-quarters in length. Racemes simple, rather erect, 2-4 or 5 inches long. Petals white, obovate. Drupes dark purple or purplish black when mature, succulent, bitter and mawkish to the taste.

Banks of streams; fence-rows, &c.: Canada to Florida. *Fl.* May. *Fr.* August.

Obs. The Wild Cherry tree attains its greatest perfection on the fertile banks of the Ohio and other rivers of the West, where it forms a fine forest tree. On the Atlantic coast it is seldom more than a foot in diameter. The wood is hard, close-grained, and takes a good polish; it is of a pale reddish tint which deepens with age. The bark is bitter, with something of a peach-kernel flavor, and contains a small proportion of prussic-acid; it is considerably used in medicine and is considered a very valuable tonic, and forms, or is said to form, the basis of several quack "Balsams" and "Pectorals." The ripe fruit is a favorite food of birds; it is used to considerable extent in preparing "Cherry Rum," "Cherry Bounce," &c. It is probable that, like most wild fruits, the quality of this varies from local causes, some considering it pleasant when fully ripe, while to others it is nauseous. *

‡ 4. **LAUROCERASUS, (LAUREL CHERRY).** Leaves evergreen; flowers from the axils of the leaves of the former season.

9. *P. Carolina'na*, Ait. Leaves oblong-lanceolate, acuminate, mucronate, entire or spiny-serrate, thick, smooth; flowers in dense racemes, shorter than the leaves; drupes black, juiceless, persistent.

CAROLINA PRUNUS. Evergreen Cherry.

Tree 30-50 feet high. Leaves shining above, almost veinless; destitute of glands. Petals small. Stamens about 15.

River banks; South Carolina to Louisiana and Arkansas. March-April.

Obs. This tree is noticed on account of the poisonous qualities of its leaves, which, according to Elliott, frequently destroy cattle that browse upon them in the spring of the year. From the leaves of the nearly related European Cherry Laurel (*P. Laurocerasus*) is distilled

the celebrated Laurel Water, a poison which owes its deadly properties to the large amount of prussic-acid it contains. *

4. SPIRÆA, L. MEADOW-SWEET.

[Greek, *Speirao*, to wind ; from its fitness to form garlands.]

Calyx 5-cleft, persistent. *Petals* 5, obovate. *Stamens* 10–50. *Pods* (follicles) 3–5 or more, each 2-4- or many-seeded. *Shrubs* or *herbs*; *leaves* simple, sometimes lobed or even pinnately dissected.

1. *S. opulifo'lia*, L. Leaves roundish ovate and 3-lobed, doubly crenate-serrate ; flowers corymbose ; follicles inflated, 2–4-seeded.

OPULUS-LEAVED SPIRÆA. Nine Bark

Shrub 3–10 feet high, with spreading branches, and a loose lamellated bark, the numerous layers suggesting the popular name. *Leaves* 1–2 inches in length, and nearly as wide as long, usually 3-lobed ; *petioles* half an inch to three-quarters in length. *Corymbs* sub-umbellate, convex, crowded, hoary pubescent when young ; *common peduncles* half an inch to an inch long. *Flowers* white, often tinged with purple. *Carpels* 3–5, connate below, acuminate ; *seeds* obovoid.

Margins of streams. June.

Obs. A very showy ornamental species, which grows readily from cuttings, and should be generally cultivated. Sometimes called “Nine-Bark Syringa.”

2. *S. tomento'sa*, L. Stem and lower surface of the leaves covered with a rusty-colored wool ; leaves ovate or oblong, serrate ; racemes in a dense elongated panicle ; carpels 5, woolly.

WOOLLY SPIRÆA. Hardhack. Steeple Bush.

Stem 2–3 feet high, brittle, clothed with an easily separable wool. *Leaves* 1–2 inches long, on very short petioles ; the upper surface of a bright green color in marked contrast to the often nearly white under surface. *Flowers* pale purple.

New England—Georgia ; more rare southward. July–August.

Obs. This plant possesses considerable astringency, and is in common use in New England as a domestic remedy in diarrhœa and other complaints where astringents are required. It is a really beautiful species, and as it is much improved by cultivation, it quite as much deserves a place in the garden as some of the rarer kinds. Many other species of this genus are well known and justly admired ornamental plants ; among them are *S. ulmifolia* (Meadow-Sweet), *S. filipendula* (Drop-wort), which are herbaceous, and several shrubby ones. *

5. GE'UM, L. AVENS. .

[Greek, *geuo*, to relish, or taste well ; the roots being rather aromatic.]

Calyx concave, 5-cleft, usually with a *bractlet* at each cleft. *Petals* 5. *Stamens* numerous. *Akenes* numerous, in a head ; *styles* long, persistent, tailed, and after flowering hooked at the summit. *Perennial herbs* ; *leaves* pseudo-pinnate or lyrate.

1. *G. riva'le*, L. Radical leaves, interruptedly pinnate, the terminal



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lobe large ; calyx segments erect ; petals purplish-orange, erect ; style jointed and bent in the middle, upper joint plumose.

RIVER GEUM. Water Avena. Purple Avena.

Stem about 2 feet high, nearly simple, rather retrorsely pilose. *Principal leaflets* 3-5 ; lateral ones obovate ; terminal one 2-3 inches long and wider than long ; *common petioles* 6-9 inches in length. *Flowers* nodding. *Calyx* brown-purple. *Petals* inversely heart-shaped, contracted into a claw, longer than the calyx. *Carpels* in a stalked head, very hairy. *Styles* slender, dark purple.

Bogs and wet meadows : New England to Pennsylvania. May-June.

FIG. 82 The Water Avena (*Geum rivale*), reduced.

Obs. The root of the Water Avena is tonic and powerfully astringent, and is used as a popular remedy in diarrhœa, dyspepsia, &c. A decoction is made and taken with sugar and milk in the same manner as coffee. *

6. POTENTIL'LA, L. CINQUEFOIL.

[Latin, *potens*, powerful ; in reference to supposed medical properties.]

Calyx 5-cleft, with an external bract at each cleft, thus appearing 10-cleft. *Petals* mostly 5. *Stamens* numerous. *Style* lateral or terminal, deciduous. *Akenes* numerous, often rugose, capitate on a dry persistent villous receptacle. *Seed* suspended ; *radicle* always superior. *Herbaceous* or *suffruticose*. *Leaves* pinnately or palmately compound.

1. P. Norve'gica, L. Hirsute ; stem erect, dichotomous above ; leaves palmately 3-foliolate, the cauline ones on short petioles ; leaflets obovate-oblong, the uppermost lanceolate, coarsely and incisely serrate ; peduncles axillary, cymose at summit and leafy ; petals shorter than the calyx ; akenes rugosely ribbed or striate.

NORWEGIAN POTENTILLA.

Root annual. *Stem* 1-2 feet high, rather stout. *Leaflets* 1-3 inches long ; *common petioles* 1-4 inches long ; *stipules* large (often an inch or more in length). *Flowers* often numerous, in leafy cymes at summit, and on long solitary peduncles below—the lower peduncles often opposite the leaves. *Petals* yellow.

Pastures and roadsides : Northern States. Native of Lapland, Norway, and Northern America. *Fl.* July - August. *Fr.* September.

Obs. This is said to be a native in the Northern States, and British America,—but it has very much the appearance of an introduced plant,—and has not yet, so far as I know, acquired a *common name*. It is only entitled to the notice of the farmer, as being a coarse, homely, worthless intruder in his pasture fields.

2. P. Canaden'sis, L. Villous ; stems procumbent and ascending ; leaves palmately 5-foliolate ; leaflets cuneate-obovate, incisely serrate-dentate near the apex ; peduncles axillary, solitary, elongated ; petals longer than the calyx ; akenes somewhat rugose.

CANADIAN POTENTILLA. Cinquefoil. Five-finger.

Root perennial. *Stem* 2 or 3-12 and 18 inches long, slender, somewhat branched, often several from the same root. *Radical leaves* on petioles 2-6 or 8 inches long ; *stem leaves* nearly sessile : *leaflets* half an inch to 1-2 inches long. *Peduncles* about as long as the leaves. *Petals* yellow.

Old neglected fields ; borders of woodlands, &c. Canada to Georgia. *Fl.* April - June. *Fr.* June - August.

Obs. The *P. simplex*, of authors, is no doubt properly regarded as only a variety of this. Both varieties are rather harmless, though worthless ; and are merely indicative of a poor soil, or a thriftless farmer. Some lands, when kept as pasture fields, seem to have an almost incurable tendency to lose the valuable Grasses, and to become speedily overrun

with Cinquefoil. Lime and manure, however, will work wonders in the worst of soils.

7. FRAGA'RIA, *Tournef.* STRAWBERRY.

[Latin, *fragrans*, odorous ; in reference to its fragrant fruit.]

Calyx, *corolla*, and *stamens*, the same as in *Potentilla*. *Styles* deeply lateral. *Akenes* numerous, smooth, scattered on the enlarged succulent or pulpy *receptacle*, or embedded in pits on its surface. Perennial stoloniferous herbs. *Leaves* 3-foliolate ; leaflets coarsely dentate. *Flowers* several, cymose on a scape-like peduncle ; sometimes *diacious* by abortion.



1. *F. ves'ca*, L. Peduncles usually longer than the leaves ; calyx of the fruit reflexed ; fruit conical or hemispherical,—the akenes superficial.

EATABLE FRAGARIA. English Strawberry. Garden Strawberry.

Fr. Le Fraisier. *Germ.* Die Erdbeerpflanze. *Span.* Fresera.

Whole plant hairy. *Root* perennial, and the leaves often green through the winter. *Stem* very short—but several slender prostrate radicle runners, 1–2 feet long, are thrown out from the crown of the root. *Leaves* mostly radical ; common petioles 3–8 or 9 inches long ; leaflets ovate or cuneate-obovate, plicate, 1–3 or 4 inches long. *Cymes* 5–12 or 15-flowered, with 2 or 3 foliaceous bracts at base, on peduncles 4 or 5–10 or 12 inches in length. *Flowers* sometimes abortive. *Petals* white. *Receptacle* (commonly regarded as the fruit) red or yellowish white, often long and slender, bearing the akenes superficially and rather prominently on the even surface.

Gardens : cultivated ; also indigenous. *Fl.* April. *Fr.* May–June.

FIG. 83. The Strawberry flower (*Fragaria vesca*) with numerous stamens and pistils. 84. The fruit which consists of true fruits (akenes, one from each pistil) scattered over the surface of an enlarged and pulpy receptacle.

Obs. Varieties of this and of other species (as *F. ELATIOR*, *Ehrh.* and *F. CHILENSIS*, *Ehrh.*), and probably hybrids, have been produced by long cultivation; the list of those kinds that have been found valuable either for size, flavor or productiveness, is a long one, and is yearly increased by the efforts of cultivators to improve on the already established varieties. For several years past the so-called "strawberry question," has occupied a large share of attention from fruit-growers and writers on horticulture,—the question involving the nature of the plant; whether it was hermaphrodite or dicecious, whether the pistillate varieties changed to staminate, &c. These points have been discussed at great length, and to say the least, with earnestness. The following are the conclusions arrived at by the Horticultural Society of Cincinnati, and published as the result of a long series of careful examinations.

"Wild or cultivated, the strawberry presents, in its varieties, four distinct forms or characters of inflorescence.

1st. Those called *pistillate*, from the fact that the stamens are abortive, and rarely to be found without a dissection of the flower. These require extrinsic impregnation.

2d. Those called *staminate*, which are perfectly destitute of even the rudiments of pistils, and are necessarily fruitless.

3d. Those called *Hermaphrodite* or perfect, having both sets of organs, stamens and pistils, apparently well developed. These are not generally good and certain bearers, as we should expect them to be. With few exceptions they bear poorly, owing to some unobserved defect, probably in the pistils. One-tenth of their flowers, generally produce perfect and often very large berries.

4th. A rare class—a sort of subdivision of the preceding—has not only hermaphrodite flowers, but also some on the same truss that are of a pistillate character; and sometimes, in the same plant, a truss will be seen on which all the flowers are pistillate."

Individual plants are frequently to be found, in strawberry beds, in which the flowers are all abortive,—the stamens having the appearance of coarse blighted monstrosities—the pistils abortive—and the receptacle failing to enlarge. The Gardeners call these male plants,—and insist that their presence is absolutely indispensable, to insure a crop of fruit. But the flowers in question, are palpably neutral, and nothing more than blights. Although the true fruit of this plant consists of mere dry specks, or bony particles (*i. e.* the minute akenes), scattered over the surface of the enlarged receptacle,—yet the receptacle itself furnishes a pulpy substitute of the most delicious character. As it is only the receptacle and not the true fruit for which the strawberry is cultivated, the question has been raised, whether this enlargement of the receptacle may not take place, without the ovules being fertilized. Mr. G. W. Huntsman, of Flushing, L. I., gives in "*Pardee's Complete Manual for the Cultivation of the Strawberry*," (a valuable work for the growers of the fruit), an account of some experiments, which go to show that unless the ovules are impregnated, the receptacle fails to enlarge. He enclosed some

plants of a pistillate kind beneath a glass, to protect them from receiving the pollen from neighboring plants, applying pollen to some blossoms and leaving the majority without this impregnation ; only those to which the pollen was applied perfected fruit. SHAKSPEARE has the following allusion to the *habitat*, or associates of the plant, to illustrate a moral sentiment :

“The *Strawberry* grows underneath the Nettle ;
And wholesome berries thrive and ripen best,
Neighbor'd by fruit of baser quality.”

King Henry V. *

2. F. Virginia'na, Ehrh. Peduncles commonly shorter than the leaves ; calyx of the fruit spreading ; fruit ovoid, nodding,—the akenes imbedded in the pitted surface of the receptacle.

VIRGINIAN FRAGARIA. Wild Strawberry.

Obs. This native species is usually a smaller plant (perhaps for want of culture), but has a close general resemblance to the preceding,—and is frequent in old fields and meadows throughout the U. States. Drs. TORREY and GRAY remark, that “the deeply pitted fruit affords the only character for this species that can be wholly relied upon ;” and even that, I fear, is not unexceptionable. It is a deep purple, when mature,—and in its wild state, of a more sprightly (sub-acid) flavor than the cultivated sorts.

8. RU'BUS, L. BRAMBLE.

[Latin, *Ruber*—or Celtic, *Rub*—red ; from the color of the fruit, or branches.]

Calyx flattish at base, 5-parted, without bracts at the clefts. *Petals* 5. *Stamens* numerous. *Carpels* mostly numerous, capitate on a protuberant spongy receptacle, becoming succulent and drupaceous, cohering and forming a compound berry, either deciduous or persistent. *Perennial* and mostly *suffruticose* plants. *Stems* erect or procumbent, usually biennial and armed with prickles. *Leaves* pinnately or pedately compound, sometimes simple.

‡ 1. CARPELS forming a hemispherical fruit, concave beneath, and deciduous or falling away from the dry receptacle when ripe, (RASPBERRY.)

* *Leaves* simple.

1. R. odora'tus, L. Stem fruticose, erect, unarmed, hispid with glandular hairs ; leaves palmately 3 – 5-lobed, unequally serrate ; stipules nearly free, deciduous ; corymbs terminal, spreading, glandular-pilose and viscid ; flowers large ; sepals with a long acumination.

ODOROUS RUBUS. Rose-flowering Raspberry.

Root creeping. *Stem* perennial, 3 – 5 feet high, branching. *Leaves* 4 – 8 inches long, and nearly as wide as long, cordate at base : *petioles* 2 – 4 or 6 inches long. *Flowers* corymbose ; peduncles and sepals clothed with a purplish clammy glandular pubescence. *Petals* mostly purplish rose-color. *Fruit* broad, on a large receptacle, of a palish bright red or scarlet when mature—often abortive.

Rocky woodlands and mountains : Canada to Georgia. *Fl.* June – July. *Fr.* July – August.

Obs. The fruit of this is pleasantly flavored,—but is rarely perfected under cultivation ; and indeed is often abortive in its native localities. I have seen it on the mountains in August, bearing flowers and ripe fruit at the same time. It is rather a troublesome plant, when introduced into yards and gardens,—sending up numerous suckers. The nearly allied **R. Nutkanus**, *Mocino*, the white flowering Raspberry, which has white and smaller flowers, is common along the lakes of the North-west, and is sometimes cultivated.

* * *Leaves (pinnately or pedately) 3 – 5-foliolate.*

2. **R. IDÆ'US**, *L.* Stem suffruticose, erect, terete, not glaucous, hispid at base, and somewhat prickly above ; leaves pinnately 3 – 5-foliolate ; leaflets rhomboid-ovate ; flowers in paniculate corymbs ; petals entire ; carpels slightly rugose, finely pubescent, not pitted in drying.

IDA RUBUS. Antwerp Raspberry. Garden Raspberry.

Fr. Framboisier. *Germ.* Die Himbeerstaude. *Span.* Frambuésos.

Root creeping. *Stem* 3 – 5 feet high, branching, mostly hispid when young, especially towards the base—smoothish (or sometimes pubescent) and armed with slender recurved prickles above—the hispid bark, below, exfoliating the second year. *Lower leaves* odd-pinnate by fives, the upper ones by threes ; *common petioles* 1 – 3 or 4 inches long ; *leaflets* 2 – 4 inches long, acuminate, unequally incised-serrate, smoothish and green above, clothed with a dense white cottony tomentum beneath. *Petals* white. *Carpels* incurved at apex, clothed with a very fine, short, dense pubescence, whitish, amber-colored or purple, when mature.

Gardens : cultivated. Native of Europe. *Fl.* May. *Fr.* July.

Obs. This species is much cultivated for its favorite fruit. The plant presents some varieties—particularly in the size and complexion of the fruit ; and I am not sure that the following nearly allied native species, which is found on our mountains, is not sometimes seen, and mistaken for it in the gardens. It requires some attention to keep the plant from spreading unduly, in a mellow soil, by means of its rambling roots.

3. **R. strigo'sus**, *Mx.* Stems slightly glaucous, beset with stiff straight bristles (some of them becoming beak-hooked prickles) ; leaflets oblong-ovate ; fruit light red.

STRIGOSE RUBUS. Wild Red Raspberry.

Stem 3 – 5 feet high, light brown. *Lower leaves* odd-pinnate by fives, the *upper ones* ternate ; *leaflets* about 3 inches long, hoary beneath, the terminal one often cordate at base. *Corymbs* 4 – 6-flowered, axillary and terminal, often aggregated and forming a leafy panicle at the top.

Hill sides—especially in cleared land. *Fl.* May. *Fr.* July.

Obs. This species is common northward, especially in mountainous regions. It often appears in great profusion where timber lands have been burned over. We have seen it on the clearings in Maine, in the fruiting season, in such abundance as to give an uniform red color to large tracts, and having a delicious flavor not equalled by the cultivated species—if that be really distinct. The fruit is largely collected in Maine for making Raspberry Syrup. If the juice is squeezed from the berries

and allowed to ferment 12 or 24 hours, according to the temperature, a thick coagulum separates from the dark clear portion, which possesses a much higher flavor than the unfermented juice. If bottled, and the bottle filled so as to allow just room for the cork, the juice will keep in a cellar for a year or more. *

4. *R. occidentalis*, L. Stem suffruticose, rather flaccid and leaning or arched, terete, smooth and glaucous, armed with recurved prickles; leaves pinnately 3- (rarely 5-) foliolate; leaflets lance-ovate; flowers in subumbellate corymbs; petals often emarginate; carpels smoothish, pitted in drying.

WESTERN RUBUS. Wild or Black Raspberry. Thimble-berry. Black Caps.

Stem 5-8 or 10 feet long, sparingly branched, limber and often arching over so that the summit comes to the ground and takes root, mostly purplish and pruinose or covered with a fine bluish-white powder. *Leaflets* mostly in threes, 2-4 or 5 inches long, often with a long acumination, and subcordate at base, smoothish above, clothed with a dense glaucous tomentum beneath. *Petals* white. *Fruit* dark purple, or nearly black (rarely whitish *alboque simillima Graculo!*) when mature.

Canada to Georgia and Missouri: Borders of woodlands, fence-rows, &c. *Fl.* May. *Fr.* July.

Obs. The fruit of this is smaller and less esteemed than that of the preceding,—but is nevertheless sweet and agreeable. The plant, however, is generally treated as a weed, on all neat farms.

2. CARPELS forming an ovoid or oblong fruit, persistent on the somewhat juicy receptacle (BLACKBERRY).

5. *R. Canadensis*, L. Stem fruticose, procumbent, armed with numerous short recurved prickles; leaves mostly 3-foliate; leaflets ovate-acute, thin; fruit large, sweet.

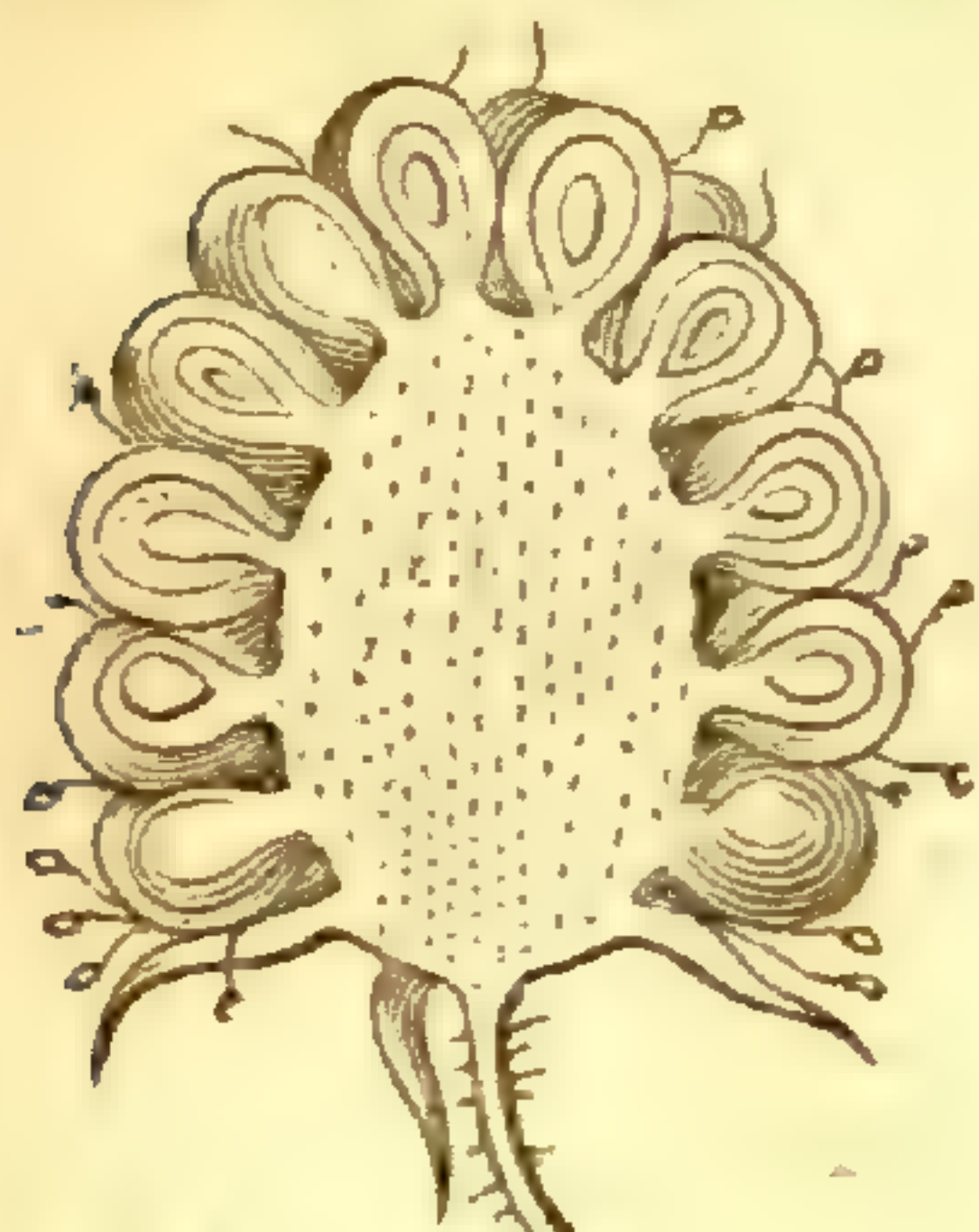
CANADIAN RUBUS. Dewberry. Running Brier.

Stem 4-8 or 10 feet long, slender, trailing, smoothish—often several from the same root running in different directions, and giving out numerous leafy pubescent flowering branches, which are nearly erect, and 2-4 or 6 inches long. *Leaflets* mostly in threes (sometimes pedately in fives), three fourths of an inch to an inch and a half long. *Flowers* terminal and subterminal on the short branches, few and rather large, somewhat corymbose by the elongation of the lower axillary pedicels. *Corolla* white. *Fruit* oblong, obtuse or often roundish, large (half an inch to near an inch in diameter), black when mature, very succulent and sweet.

Rocky sterile soils, old fields, &c. Canada to Virginia. *Fl.* May. *Fr.* July.

Obs. Our Dewberry is a fine fruit, the earliest and the sweetest *Blackberry*; but it is not the “Dewberry” of England—which is the *R. cæsius*, L. There has been some confusion respecting our plant, among the Botanists; and Prof. DE CANDOLLE seems not to have had a clear conception of the species. But there is scarcely a farmer’s boy who is not well acquainted with it, from having often encountered its prickly trailing stems with his naked ankles, while heedlessly traversing the old

fields where it abounds. On well-managed farms, however, the plant is becoming somewhat rare.



A.H.

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6. *R. villosus*, Ait. Stem fruticose, erect, angular, branching, armed with stout curved prickles; young branches and peduncles glandular-villous; leaves 3-foliolate or pedately 5-foliolate; leaflets ovate or lance-oblong, villous beneath, the petioles and midribs aculeate; racemes elongated, many-flowered.

VILLOUS RUBUS. Blackberry. Common Brier. Bramble.

Fr. La Ronce. *Germ.* Der Brombeerstrauch. *Span.* Zarza.

Root creeping. *Stem* 3-6 or 8 feet high, stout, ridged or angular and somewhat furrowed. *Leaflets* 2-3 or 4 inches long, mostly acute. *Racemes* rather large, sometimes leafy. *Petals* white. *Fruit* ovoid-oblong or cylindric—sometimes near an inch long—changing from green to red or purplish, and finally black when mature.

Old fields, thickets and borders of woods: throughout the United States. *Fl.* May *Fr.* July - Aug.

Obs. Every one knows the common Brier. The root, both of this and the preceding, being moderately astringent, is a popular remedy for diarrhoea and mild dysentery. The ripe fruit affords a pleasant jam, which is also considered salutary in such cases. Even the knots which are formed on the branches, from the puncture of insects, were formerly carried by credulous simpletons, as a sort of amulet or charm against the tooth-ache! The plant, nevertheless, is often something of a nuisance on our farms, from its tendency to spread and take possession of neglected fields. This plant varies considerably in habit and in hairiness, some forms being nearly prostrate, while others form erect bushes. The size and shape of the fruit varies exceedingly; apparently attaining its greatest perfection near the sea-shore. Latterly, considerable attention has been given to the cultivation of some of the finer varieties of this plant. The kind known as the "Lawton" or "New Rochelle Blackberry," is a splendid fruit, and is now becoming abundant in the markets of our cities. It is worthy of the attention of every fruit-grower.

7. *R. cuneifolius*, Pursh. Stem subterete; branches pubescent; leaves cuneate-obovate, sub-plicate, tomentose beneath; racemes few-flowered.

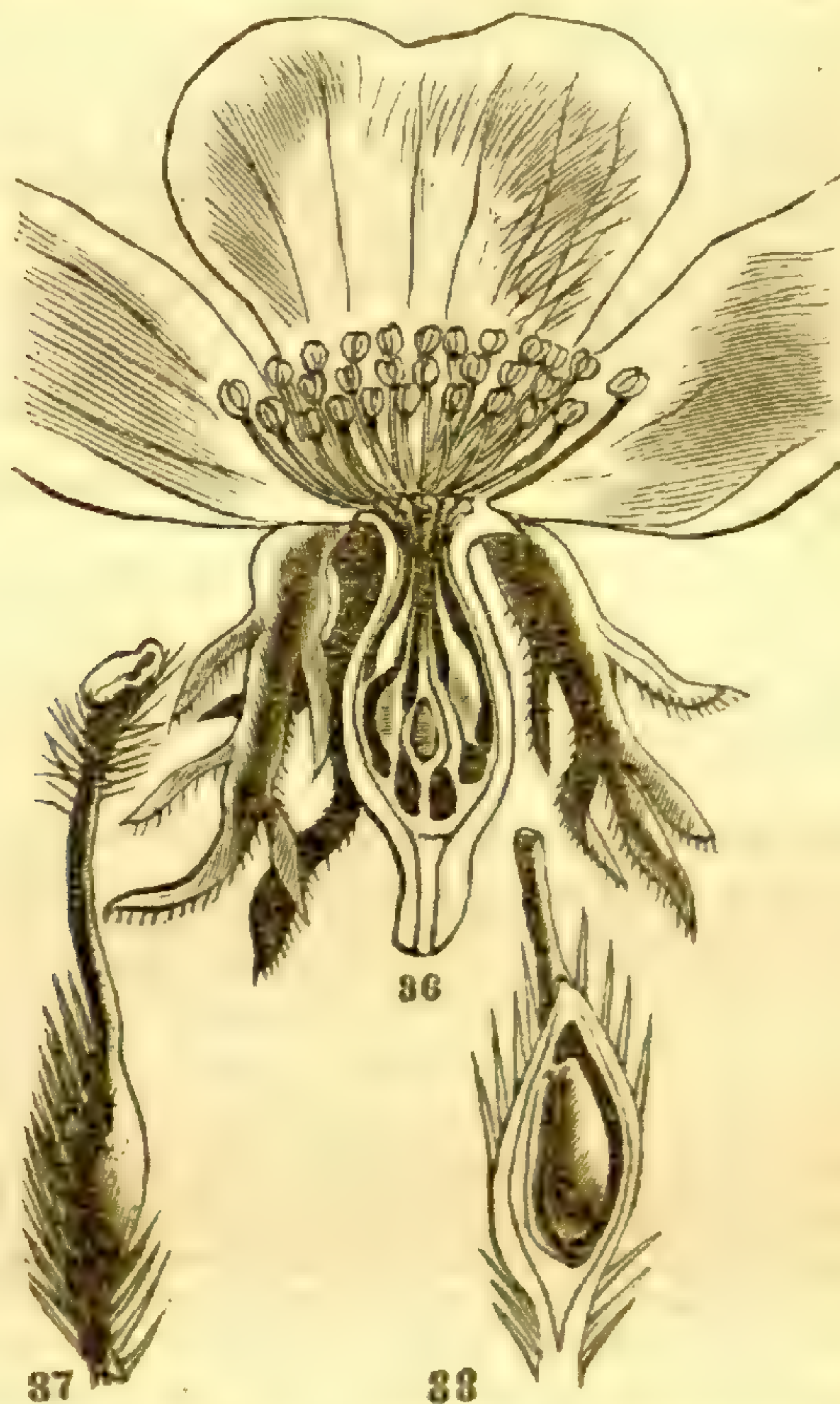
WEDGE-LEAVED RUBUS. Sand Blackberry.

Stem 3-5 feet high, branched. *Leaflets* mostly ternate, 1-2 inches long, cuneate, and obtuse with a short abrupt acumination; *common petioles* half an inch to an inch in length. *Flowers* sometimes tinged with red. *Fruit* oval, about half an inch long, black when mature, succulent and well flavored.

New Jersey and southward.

FIG. 85. Fruit of the Blackberry [*Rubus villosus*], divided to show that it is made up of numerous small drupes, adhering to the receptacle.

Obs. This species, which is common in dry soils in the Southern States, produces a fruit which is considered superior in flavor to the preceding.



9. RO'SA, *Tournef.* ROSE.

[The ancient Latin name.]

Calyx urceolate—the *tube* contracted at the orifice, including the numerous distinct ovaries, at length becoming fleshy or baccate; the *segments* often foliaceous at apex. *Petals* 5, obovate or obcordate, inserted with the numerous stamens on the rim of the calyx-tube. *Akenes* numerous, crustaceous, hispid, included in and attached to the inner surface of the calyx-tube. *Shrubby* and prickly plants. *Leaves* mostly odd-pinnate; *stipules* adnate to the petiole.

FIG. 86. The flower of a Rose, divided and exhibiting the numerous pistils inserted within a hollow receptacle. 87. A separate ripened pistil or carpel. 88. A carpel opened to show the seed.

1. *R. seti'gera*, *Mx.* Stems climbing, armed with stout nearly straight prickles; leaflets 3-5, ovate, acute; flowers corymbed; styles cohering in a column as long as the stamens.

PRICKLY ROSA. Prairie Rose. Climbing Rose.

Stem long and climbing, often growing from 10-20 feet in one season. *Petioles* glandular. *Leaflets* acute, sharply serrate, smooth or downy beneath. *Flowers* reddish, nearly inodorous, deep rose color changing to white; *calyx* glandular. *Fruit* globular.

Borders of prairies: Ohio, Illinois and southward. July.

Obs. This species is often cultivated, and is well adapted to train along walls, palisades, &c. It is the only native climbing rose.

2. *R. læviga'ta*, *Mx.* Glabrous; stems armed with strong, often geminate curved prickles; leaves 3- (sometimes 5-) foliolate; leaflets coriaceous; stipules setaceous, deciduous; flowers solitary, terminal; tube of calyx ovoid, muricate with long prickly bristles.

SMOOTH ROSA. Cherokee Rose.

Stem with long flexile branches 15-20 feet in length. *Leaves* persistent, often prickly on the midrib below. *Flowers* very large, white.

South Carolina to Louisiana. April.

Obs. This evergreen species has long been cultivated at the South as the "Cherokee Rose;" its origin is not known. It is highly commended as a hedge-plant, by ELLIOTT. "In our rural economy," he says, "this plant will one day become very important. For the purpose of forming hedges, there is perhaps no plant which unites so many advantages." This Rose, however, will not stand our northern winters.

3. *R. Caroli'na*, *L.* Stem smooth, armed with stout recurved stipular prickles; leaflets mostly 5-7, oblong-oval or elliptic-lanceolate, finely serrate, somewhat glaucous beneath; flowers corymbose.

CAROLINA ROSA. Swamp Rose.

Stem 4-6 feet high, with numerous purple branches. *Leaflets* 1-2 inches long. *Flowers* mostly in terminal corymbs of 3-6 or 7 in a cluster. *Petals* red or purplish. *Fruit* (i. e. the fleshy *calyx-tube*) depressed globose, a little glandular-hispid, dark red and shining when mature.

Low swampy grounds and thickets: Northern and Middle States. *Fl.* June-July. *Fr.* September.

Obs. This is often a troublesome plant in wet meadows and low grounds, forming unsightly thickets with other weeds, if neglected. Another native species, *R. lu'cida*, *Ehrh.*, the Dwarf Wild Rose, is very common; it differs from the preceding in its unequal bristly prickles and 1-3-flowered peduncles. The Sweet Briar, *R. rubigino'sa*, *L.*, well known for its fragrant glandular foliage, is thoroughly naturalized in many places. The cultivated roses, so justly prized among flowers, are varieties produced by long and careful culture from different species of this genus. An enumeration even of the most common would occupy too much space here.

10. CRATÆGUS, L. HAWTHORN.

[Greek, *Kratos*, strength ; in allusion to the strength or firmness of the wood.]

Calyx-tube urceolate ; *limb* 5-cleft. *Petals* 5. *Stamens* numerous. *Styles* 1 – 5. *Fruit* fleshy or somewhat farinaceous, containing 1 – 5 bony 1-seeded carpels. *Thorny shrubs* or small *trees*. *Leaves* alternate, simple, often incised or lobed. *Flowers* mostly in terminal corymbs.

1. *C. Crus-gal'li*, L. Leaves obovate-cuneate or lance-oblong, serrate, coriaceous, smooth and shining, subsessile ; styles 1 – 3 ; fruit somewhat pyriform.

COCK-SPUR CRATÆGUS. Cockspur Thorn. New Castle Thorn.

Stem 10 – 15 or 20 feet high, much branched, and armed with sharp tapering thorns 2 to near 3 inches in length. *Leaves* 1 – 2½ inches long, on short petioles. *Corymbs* terminal on short rigid spurs. *Petals* white. *Fruit* middling sized, reddish brown when mature. Thickets, fence rows, hedges, &c.: Canada to Florida. *Fl.* June. *Fr.* October.

Obs. This shrub—of which there are two or three pretty distinct varieties—is, in my opinion, the best adapted for hedging, of any of the genus. Properly treated, it makes a durable and effective hedge. But until timber shall become scarce, very few farmers will take the requisite pains to insure a complete hedge, and without such care it is worse than labor lost to make such an attempt. In the language of Mr. McMAHON's excellent "*American Gardener's Calendar*," referring to the hedging experiments of negligent, slovenly farmers : "I would advise such to hold fast by the *post and rail*, and not to lose time in doing more hurt than good."

2. *C. corda'ta*, Ait. Leaves deltoid-ovate and sub-cordate at base, incised-serrate and somewhat 3-lobed, smooth, on slender and rather long petioles ; styles 5 ; fruit depressed globose.

CORDATE CRATÆGUS. Washington Thorn. Virginia Thorn.

Stem 15 – 20 feet high, much branched, and armed with slender tapering sharp thorns 1 to near 3 inches in length. *Leaves* 2 – 3 inches long, often 3-lobed like a leaf of the Red Maple. *Corymbs* terminating the young slender short branches. *Petals* white. *Styles* more or less united. *Fruit* small, bright reddish purple when mature.

Banks of streams : Virginia to Georgia. *Fl.* June. *Fr.* October.

Obs. This species is the one which has been chiefly cultivated for hedging, in Pennsylvania—where it was introduced, from the vicinity of Washington City, about the commencement of the present century. It makes a handsome hedge, but not a very substantial one ; and, in my opinion, is decidedly inferior to the Cockspur Thorn, for that purpose. I have used it extensively ; but have found it so subject to be broken into gaps, by thoughtless or reckless trespassers, that my hedges have been rather a source of vexation than of satisfaction.

3. *C. oxyacan'tha*, L. Leaves cuneate-obovate, cut-lobed, often trifid ; styles 1 – 3 ; fruit ovoid, small.

SHARP-THORNED CRATÆGUS. Hawthorn. English Thorn.

Stem 6–12 feet high, much branched; branches rugged, armed with tapering thorns about half an inch in length. *Leaves* an inch to an inch and a half long, and about as wide as long, variously lobed, often 3–5 lobed, with the terminal lobe trifid. *Stipules* of the young plant foliaceous, obliquely falcate-reniform. *Corymbs* terminal on the short branches, many flowered. *Style* mostly solitary. *Fruit* about $\frac{1}{4}$ of an inch in diameter, purple when mature.

Cultivated and naturalized. Native of Europe. *Fl.* May. *Fr.* October.

Obs. This, the Hawthorn so often mentioned by English writers, and so interwoven in English poetry, is often used for hedges, and is to some extent naturalized. Like the other species of the genus, it has a marked tendency to “sport” or form varieties, and over thirty varieties are mentioned in the English works on horticulture. Some of them flower very late in the season, others have red flowers, and there are those with pendulous and with erect branches. It is capable of being trained into a neat compact tree, and growing thus, especially the red-flowered variety, when filled with its fragrant flowers, is really charming. The ripe fruit or “haws,” are a favorite food of the birds. *

11. PY'RUS, L. PEAR AND APPLE.

[The Latin name for the Pear.]

Calyx-tube urceolate; *limb* 5-lobed. *Styles* mostly 5, often united at base. *Pome* fleshy,—containing 2–5 cartilaginous or nearly membranaceous carpels. *Seeds* 2 in each carpel or cell; *testa* chartaceous or cartilaginous. *Trees* or *shrubs*. *Leaves* alternate, simple or pinnate. *Flowers* in terminal spreading cymes or corymbs.

§ 1. *Leaves* simple.

* *Styles* 5, distinct; *fruit* not sunk in at the attachment of the stalk. (Pyrus.)

1. P. COMMU'NIS, L. *Leaves* lance-ovate, slightly serrate, the upper surface smooth; *peduncles* corymbose; *fruit* turbinate.

COMMON PYRUS. Pear. Pear-tree.

Fr. Le Poirier. *Germ.* Der Birnbaum. *Span.* El Peral.

Stem 15–30 feet high, branching; branches virgate, rather erect, forming an oblong or conical top. *Leaves* 2–3 inches long; *petioles* 1–2 inches in length. *Petals* white. *Fruit* of various size (1–2 or 3 inches in diameter), fleshy or succulent, umbilicate at apex, obovoid, tapering to the peduncle, often somewhat curved or oblique.

Cultivated. Native of Europe. *Fl.* May. *Fr.* August–November.

Obs. Many varieties of this luscious fruit have been obtained by long culture,—in which the French seem particularly to excel.

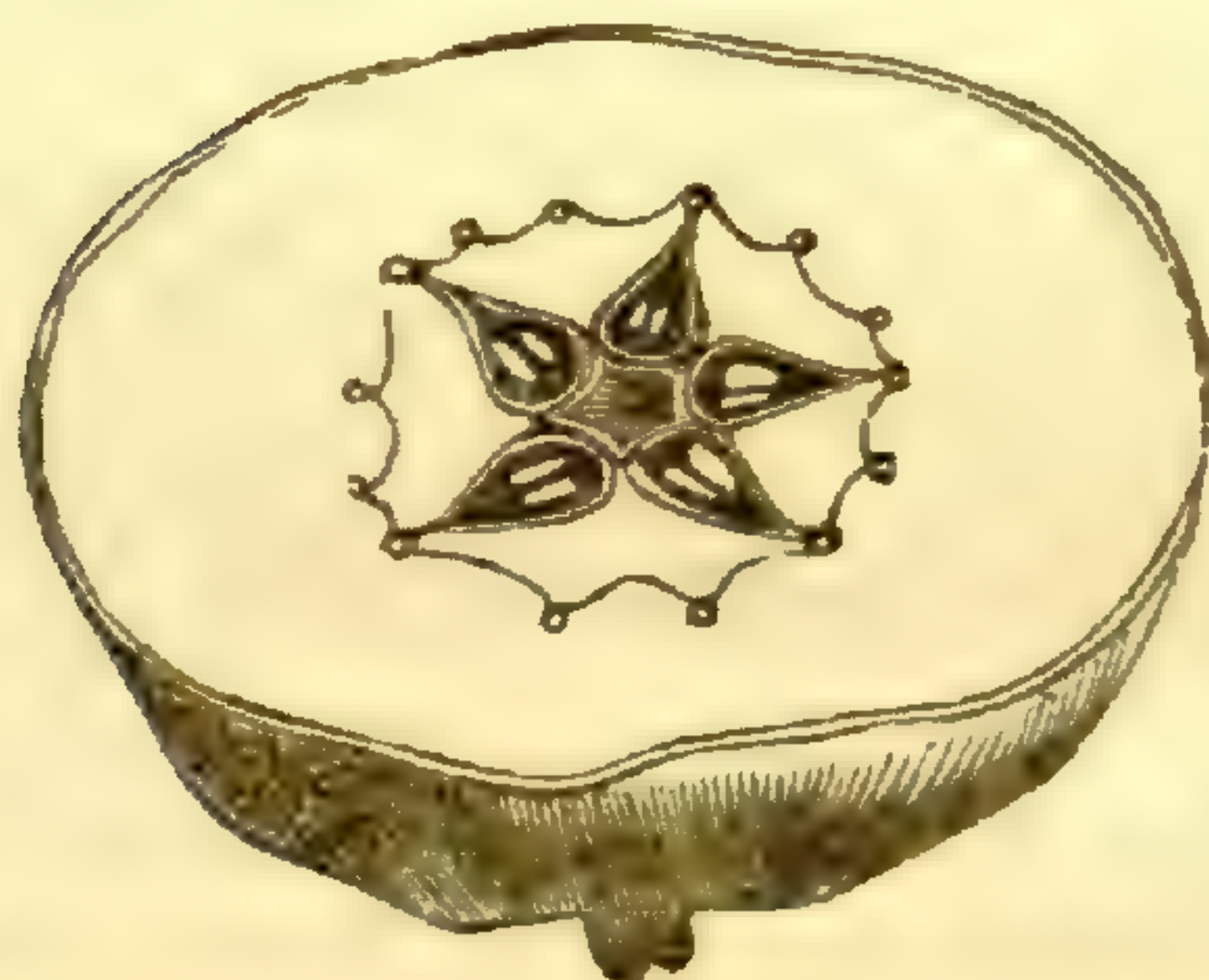
* * *Styles* 5, united at base; *fruit* sunk in at the base. (Malus.)

2. P. MA'LUS, L. *Leaves* ovate-oblong, serrate, the upper surface pubescent; *peduncles* subumbellate villous; *fruit* depressed, globose, or oblong.

APPLE PYRUS. Common Apple. Apple-tree.

Fr. Le Pommier. *Germ.* Der Apfelbaum. *Span.* Manzáno.

Stem 15–25 or 30 feet high, branching; branches mostly spreading and often geniculate, forming a broad bushy top. *Leaves* 2–3 inches long; *petioles* an inch or more in



length. *Petals* mostly pale red. *Fruit* of various size (1–3 or 4 inches in diameter), fleshy, umbilicate at both ends.

Cultivated. Native of Europe. *Fl.* May. *Fr.* July–November.

Obs. The varieties of this valuable fruit are almost innumerable,—and every farmer provides more or less of an orchard; but there is far too little attention paid to the selection of the best. It is really wonderful to observe how many worthless trees are permitted to cumber the ground, which might just as readily, and far better, be occupied by those which bear the choicest fruit.

3. *P. corona'ria*, L. Leaves broad-ovate, rounded or sub-cordate at base, incised-serrate and somewhat angulate-lobed, smoothish; peduncles corymbose; fruit depressed-globose.

FIG. 89. The flower of the Apple (*Pyrus Malus*), divided and showing the ovaries cohering with the calyx-tube. 90. A section of an Apple, in which the bulk of the fruit (pome) is formed of the fleshy enlarged calyx-tube, surrounding and cohering with the 2-seeded papery carpels.

CROWN PYRUS. Crab Apple. Sweet-scented Crab-tree.

Stem 10–15 feet high, branching; branches spreading, rugged with short spurs, forming a rather bushy top. *Leaves* 2–3 inches long; *petioles* half an inch to an inch and a half in length. *Flowers* large and fragrant; *petals* pale rose red. *Fruit* rather small (about an inch in diameter), umbilicate at both ends, fleshy but firm and hard, smooth, pale greenish yellow and very fragrant when mature—yet extremely acid.

Borders of woodlands, road-sides, &c. New York to Louisiana. *Fl.* May. *Fr.* September.

Obs. This native apple is now becoming scarce in the older settlements of Pennsylvania. In former times the ripe fruit was sought after, by notable housewives, for the purpose of making preserves.

2. *Leaves* odd-pinnate; *cymes* compound; *styles* separate; *fruit* berry-like, small. (Sorbus.)

4. **P. America'na, DC.** Leaflets 13–15, lanceolate, taper-pointed, sharply serrate, smooth; *cymes* large, flat; *fruit* red.

AMERICAN PYRUS. American Mountain Ash.

Small tree, 10–25 feet high, sometimes 4–6 inches in diameter, with a smooth bark. *Leaves* 8–12 inches or more in length; *leaflets* 2–3 inches long, pubescent when young, smooth with age. *Flowers* white; *corymbs* very compound, 4–10 inches in diameter; *fruit* acid.

Mountain woods. New England to Wisconsin. June.

Obs. This elegant tree is often seen in cultivation, and is especially conspicuous in the autumn, its large bunches of scarlet berries remaining, after the leaves have fallen, even through the winter. It is very nearly related to the European Mountain Ash, (*P. AUCUPARIA*), which is also much cultivated. Both species are valuable as ornamental trees, whether for the beauty of their foliage or fruit.

12. CYDO'NIA, Tournef. QUINCE.

[The name of a city of Crete,—whence it was obtained.]

Calyx-tube subturbinate; *limb* 5-lobed,—the lobes sometimes foliaceous. *Styles* 5. *Pome* fleshy, containing 5 cartilaginous carpels. *Seeds* several in each carpel or cell, covered with mucilaginous pulp. *Small trees* or *shrubs*. *Leaves* alternate, simple, entire or serrate. *Flowers* large, solitary, or subumbellate.

1. **C. VULGA'RIS, Pers.** *Leaves* oblong-ovate, obtuse at base, very entire, tomentose beneath; *fruit* sub-turbinate, tomentose.

COMMON CYDONIA. Quince. Quince-tree.

Fr. Le Cognassier. *Germ.* Der Quittenbaum. *Span.* Membrillero.

Stem 8–12 or 15 feet high, with spreading branches. *Leaves* 2–3 inches long; *petioles* about half an inch long. *Flowers* terminal, solitary. *Petals* reddish white. *Stamens* in a single series. *Fruit* 2 inches or more in diameter, somewhat obovoid, umbilicate at apex, abruptly tapering or produced at base, yellow when mature.

Cultivated. Native of Southern Europe. *Fl.* May. *Fr.* September–October.

Obs. The fruit of this is chiefly used for making preserves,—for which it is excellent. It is supposed to be the golden apple of the Hes-

perides, so celebrated in ancient fable ; but if the Orange had then been known, it would doubtless have been esteemed a more precious fruit by the "Western Maidens." The *C. Japonica*, *Pers.* (*Pyrus Japonica*, *Willd.*) is well known for its beauty as a flowering shrub, in the gardens ; but the fruit, though remarkably fragrant, is very hard and acerb, and of little value.

ORDER XXVII. CALYCAN'THACEÆ. (CAROLINA-ALLSPICE FAMILY.)

Shrubs with opposite entire leaves without *stipules*. The *sepals* and *petals* similar and indefinite. Otherwise mostly as in *Rosaceæ*.

1. CALYCAN'THUS, L.

[Greek, *kalyx*, a cup, and *anthos*, a flower ; from the closed cup which contains the pistils.]

Sepals numerous, mostly colored like the petals, united below into a cup. *Petals* similar to the sepals, inserted in several rows on the top of the closed calyx-tube. *Stamens* numerous, just within the petals ; some of them sterile. *Pistils* many, enclosed in the calyx-tube, inserted on its base and inner face. *Fruit* like a rose hip, but larger and dry when ripe, enclosing the large akenes. *Shrubs* with opposite entire leaves, and large, lurid purple flowers terminating the leafy branches. Bark and foliage aromatic ; the crushed flowers exhaling more or less the fragrance of strawberries.

Carolina-allspice. Sweet-scented Shrub. Strawberry-bush.

Obs. There are several species of this genus cultivated for the fragrance of their rather unsightly flowers ; they are natives of the southern portion of the United States, but are quite hardy northward. The three species, or, as they are classed by some, varieties, are distinguished as follows :

C. flo'ridus, L. Leaves oval or roundish, downy beneath.

C. læviga'tus, Willd. Leaves oblong, smooth, green on both sides ; flowers smaller.

C. glau'cus, Willd. Leaves oblong- or lance-ovate, pointed, glaucous or whitened beneath.

ORDER XXVIII. ONAGRA'CEÆ. (EVENING PRIMROSE FAMILY.)

Herbs with alternate entire leaves without *stipules* and axillary flowers with the parts in fours. Tube of the *calyx* adherent to the 2-4-celled ovary and prolonged above it ; its lobes valvate in the bud. *Petals* valvate in the bud and with the 8 *stamens* inserted on the summit of the calyx-tube. *Pollen* grains connected by cobwebby threads. *Style* single, slender ; *stigma* 2-4-lobed or capitate. *Pod* 4-celled, 4-valved ; *placentæ* in its axis. *Seeds* without albumen.

An order containing some plants (such as the *Fuchias*), which are interesting for their beauty, but none of Agricultural value.

1. *ÆNOTHE'RA*, L. EVENING PRIMROSE.[Greek, *Oinos*, wine, and *Thera*, a chase ; application obscure.]

Calyx of 4 membranaceous sepals, united below into a long tube ; *limb* reflexed, and, with a portion of the tube, deciduous. *Petals* 4. *Stamens* 8, erect or declined. *Capsule* more or less oblong and quadrangular, 4-valved, many-seeded.

1. *Æ. BIEN'NIS*, L. Stem erect, somewhat branched, pilose and roughish ; leaves ovate-lanceolate, repand-dentate ; petals inversely heart-shaped ; capsule obtusely 4-angled, subsessile.

BIENNIAL *ÆNOTHERA*. Evening Primrose. Night Willow-herb.

Root biennial. *Stem* 2-5 or 6 feet high, rather stout, hairy and usually greenish. *Leaves* 2-6 inches long, sessile or subsessile. *Flowers* large, in a terminal leafy spike. *Calyx* colored,—the tube much longer than the ovary. *Petals* yellow. *Ovary* oblong. *style* rather longer than the corolla ; *stigma* cruciate, elongated, linear. *Capsule* obscurely 4-sided, an inch to an inch and a half long, smoothish, splitting into 4 sub-linear valves.

Fields, fence-rows, &c. throughout the United States. *Fl.* June-September. *Fr.* August-October.

Obs. This coarse plant is entitled to the notice of the farmer, merely in consequence of being a common, rather conspicuous, and worthless weed, in pastures, and on the borders of cultivated fields. A variety, of yet stouter growth, and very large flowers (*Æ. grandiflora*, of some authors), is often tolerated in gardens. There is another species (*Æ. fruticosa*, L. of smaller size, with more slender, yet more rigid stems), which is quite common in old fields ; but is scarcely of sufficient importance, even as a weed, to claim a place in this work.

ORDER XXIX. *GROSSULA'CEÆ*. (CURRANT FAMILY.)

Small shrubs, often spinose or prickly, with alternate palmately lobed and veined leaves and flowers in racemes or small clusters. *Calyx-tube* adherent to the ovary, the *limb* 5-lobed, sometimes colored. *Petals* 5, small. *Stamens* 5. *Ovary* with 2 parietal placentæ ; *styles* more or less united. *Fruit* a berry, crowned with the shrivelled remains of the flower. *Seeds* mostly numerous ; *embryos* minute, in hard albumen.

A small Order,—and of little or no interest beyond the genus here noticed.

1. *RI'BES*, L. GOOSEBERRY AND CURRANT.

[An ancient Arabic name,—of obscure meaning.]

 The *Generic* character the same as that of the *Order*.

* *Stems* more or less prickly.

1. *R. UVA-CRIS'PA*, L. Leaves obtusely 3-5-lobed, somewhat villous beneath and on the petiole ; peduncles mostly 1-flowered, bracteate ; sepals reflexed ; ovary and style villous ; berry hairy or smooth.

Goose-berry.

Fr. Vrai Groseillier. *Germ.* Die Stachelbeere. *Span.* Uva espina.

Stem 2-3 feet high, diffusely branching. *Leaves* $\frac{3}{4}$ of an inch to an inch and a half in

length, and as wide as long, incisely lobed and dentate; *petioles* generally much shorter than the leaves, often margined. *Peduncles* solitary or in pairs, often bracteate near the middle. *Petals* pale greenish yellow. *Berries* solitary, pendulous, large, oval, of a greenish amber color when mature.

Gardens: cultivated. Native of Europe. *Fl.* April. *Fr.* July.

Obs. This species is much cultivated for its fine fruit; but (in Pennsylvania, at least) it often fails to perfect the fruit, from some cause not well understood. Judging from specimens which I have seen, it appears to succeed much better in England, and the fruit attains to a much larger size in that country.

**** Stems not prickly.**

2. *R. ru'brum*, L. Leaves obtusely 3–5-lobed, smooth above, pubescent beneath; racemes pendulous, nearly smooth; calyx rotate, the segments rounded.

RED RIBES. Red Currant.

Fr. Groseillier rouge. *Germ.* Gemeine Johannisbeere. *Span.* Ribes roja.

Stems numerous, slender, sparingly branched, 2–4 feet high. *Leaves* 1–2 or 3 inches long, and rather wider than long, unequally incised-dentate; *petioles* about as long as the leaves. *Racemes* produced from lateral buds distinct from the leaves; *bracts* ovate. *Petals* greenish yellow, minute. *Berries* globose, red (rarely whitish or pearl-color) when mature.

Gardens: cultivated. Native of Europe and the northern regions of America. *Fl.* April. *Fr.* June–July.

Obs. This is so easily cultivated, and is so constantly productive, that it is to be found in almost every garden. The fine acid fruit yields a favorite jelly for the table; and even the green berries are much used by the pastry cook.

3. *R. ni'grum*, L. Leaves 3–5-lobed, sprinkled with yellow resinous dots beneath; racemes loose, pilose; calyx tubular-campanulate.

BLACK RIBES. Black Currant.

Fr. Cassis. *Germ.* Schwarze Johannisbeere. *Span.* Ribes negra.

Stems numerous, slender, 3–5 feet high. *Leaves* 2–3 inches long, and nearly as wide as long, dentate-serrate, pubescent beneath; *petioles* shorter than the leaves. *Racemes* somewhat pendulous, generally with a distinct single-flowered peduncle at base; *bracts* subulate. *Petals* pale yellowish green (sometimes changed into stamens or *staminodia*). *Berries* roundish-ovoid, purplish black when mature.

Gardens: cultivated. Native of Northern Europe. *Fl.* April. *Fr.* June–July.

Obs. This is sometimes found in gardens; but the fruit being of a rather insipid or flat sweetish taste, it is not much esteemed. It however affords a jelly which is a popular and useful remedy for sore throat, colds, &c. There are numerous other species of this genus; but, so far as I know, the foregoing are all that are cultivated (and perhaps all that are worth cultivating) for the sake of the fruit.

There are two species cultivated as flowering shrubs, one indigenous along the great rivers of the West, and the other a native of California.

ORDER XXX. CUCURBITACEÆ. (GOURD FAMILY.)

Herbaceous mostly succulent vines with tendrils, alternate palmately veined or lobed leaves and monoecious or dioecious (often monopetalous) flowers. *Calyx* of 4-5 (rarely 6) sepals, united into a tube, and in the fertile flowers adherent to the ovary. *Petals* as many as the sepals, more or less united, and cohering with the calyx. *Stamens* 3-5 inserted into the base of the corolla or calyx, distinct or variously united by their filaments and long, mostly *tortuous*, *anthers*. *Ovary* 1-3-celled,—the thick fleshy *placenta* often filling the cells; *stigmas* thick, dilated or fringed. *Fruit* (*Pepo*) usually fleshy, with a firm (sometimes a ligneous and occasionally a membranous) rind. *Seeds* flat, destitute of albumen; *cotyledons* foliaceous.

This Order—so well known for its *culinary* products—contains some which are possessed of active medicinal properties (such as the *Colocynth*, of the shops—*Cucumis Colocynthis*, L.); but few, if any, of Agricultural interest, beyond those here mentioned.

* *Petals connected at the base only.*

1. LAGENA'RIA, Ser. GOURD.

[Greek, *Lagenos*, a flagon or bottle; from the shape of the fruit.]

Calyx campanulate or subturbinate, 5-toothed,—the segments subulate-lanceolate, shorter than the tube. *Petals* 5, obovate, inserted within and beneath the margin of the calyx. *Stamens* 5, triadelphous, the fifth one free. *Stigmas* 3, sessile, thick, 2-lobed, granular. *Fruit* at first fleshy and pubescent, finally with a smooth ligneous rind. *Seeds* compressed, obovate, somewhat 2-lobed at apex, the margin tumid.

1. L. VULGA'RIS, Ser. Softly pubescent; stem climbing; leaves roundish-cordate, acuminate, denticulate, with two glands at base; fruit clavate-ventricose.

COMMON LAGENARIA. Calabash. Bottle Gourd.

Fr. Calabasse. Germ. Der Kuerbiss. Span. Calabaza.

Whole plant somewhat viscid, and emitting a fetid musky odor. *Stem* 10-15 or 20 feet long, slender, branching, climbing by *tendrils* which are 2-4-cleft. *Leaves* 4-6 or 8 inches long; *petioles* 2-6 inches long. *Flowers* axillary, on long peduncles; *corolla* white, with green nerves and veins. *Fruit* 12-18 inches long, and 4-6 or 8 inches in diameter, unequally bi-ventricose, finally nearly hollow or partially filled with the loose dry suberose *placenta*,—the *rind* yellowish or pale brown, thin and hard. *Seeds* in a dry membranous *arillus*.

Gardens and lots: cultivated. Native of the tropical regions. Fl. July-August. Fr. September-October.

Obs. The thin firm woody shell of the fruit affords a very convenient kitchen utensil,—and the plant is sometimes cultivated for the sake of that fruit, by cottagers and farmers who cannot afford, or do not choose to purchase more costly utensils.

There is cultivated occasionally, for the table, a cucurbitaceous fruit of extraordinary length, called "Vegetable Marrow,"—which seems to belong to this species, and perhaps may be the var. *clavata* of *Seringe*.

2. CU'CUMIS, L. CUCUMBER AND MELON.

[Said to be derived from the Celtic, *Cucc*, a hollow vessel.]

Calyx tubular-campanulate, 5-toothed,—the teeth subulate, scarcely as long as the tube. *Petals* 5, nearly distinct and but slightly adnate to

the calyx. *Stamens* 5, triadelphous. *Stigmas* 3, subsessile, thick, 2-lobed. *Fruit* fleshy, indehiscent. *Seeds* white, lance-oblong, compressed, acute at base and on the margin.

1. *C. ME'LO, L.* Stem prostrate; leaves subcordate, obtuse, somewhat angled, the angles rounded; fertile flowers perfect; fruit oval or subglobose, torulose.

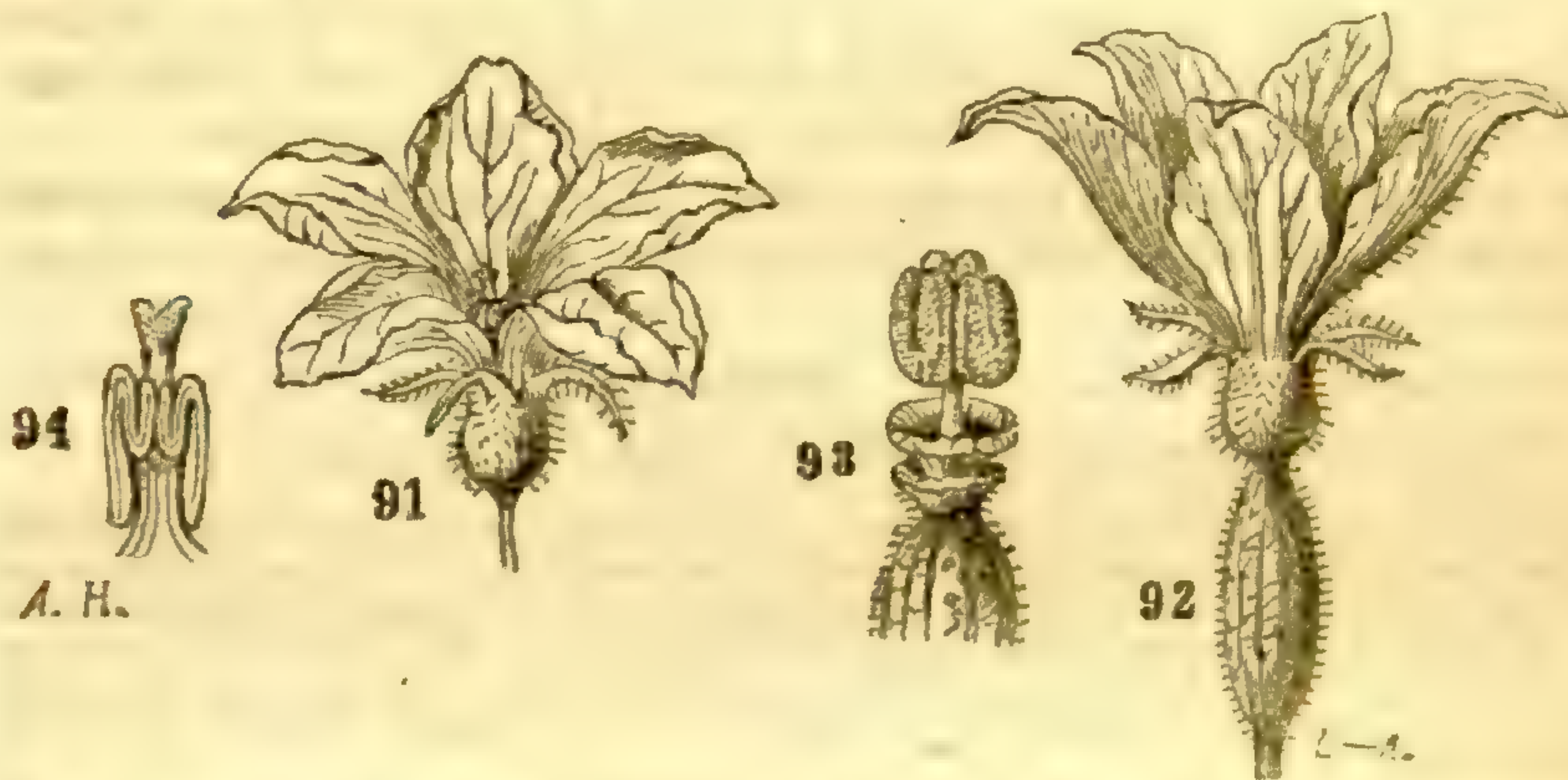
MELON CUCUMIS. Musk-melon. Cantaloupe.

Fr. Melon. *Germ.* Die Melone. *Span.* Melon almizcleño.

Hirsute and roughish. *Root* annual. *Stem* 5-8 or 10 feet long, sparingly branched; *tendrils* simple. *Leaves* 3-4 inches long, and rather wider than long; *petioles* 2-3 inches in length. *Flowers* axillary, on short peduncles. *Corolla* yellow. *Fruit* 4-6 or 8 inches in diameter, often longitudinally ridged (torulose),—the flesh, when mature, yellowish, succulent, and of a saccharine spicy flavor.

Gardens and lots: cultivated. Native of Asia. *Fl.* June-July. *Fr.* August.

Obs. The fruit of this—of which there are several varieties—is a great favorite with many persons,—and it is often cultivated at the North; but the best specimens are grown in the warm sandy soil of New Jersey, and the Southern States.



2. *C. SATI'VUS, L.* Stem procumbent; leaves subcordate and angulate-lobed, the terminal lobe prominent; fruit oblong, obscurely and obtusely trigonous, scabrous when young, finally smoothish.

CULTIVATED CUCUMIS. Cucumber.

Fr. Le Concombre. *Germ.* Die Gurke. *Span.* Pepino.

Rough and hispid. *Root* annual. *Stem* 6-12 or 15 feet long, somewhat branching; *tendrils* simple. *Leaves* 3-5 or 6 inches long, and nearly as wide as long, somewhat 5-angled and lobed; *petioles* 2-4 inches in length. *Flowers* axillary, on short peduncles; *corolla* yellow. *Fruit* 6-12 inches long and 2-3 inches in diameter, rough with bristle-pointed tubercles when young, smoothish and tawny yellow when mature.

Gardens and lots: cultivated. Native of Tartary and the East. *Fl.* June-September. *Fr.* August-October.

FIG. 91. A staminate flower of the Cucumber (*Cucumis sativus*). 92. A fertile flower of the same. 93. A pistil. 94. The stamens, showing the contorted anthers.

Obs. Known to every one,—and universally cultivated for the young or green fruit. The young fruit (sometimes called Gherkins) is much used for Pickles. In the Middle States, the popular time for planting the seeds is “the first day of May, before sunrise.”

3. *C. ANGU'RIA*, *L.* Stem prostrate, slender; leaves palmate-lobed and sinuate, cordate at base; fruit sub-globose or oval, echinate.

Prickly Cucumber. Jerusalem Cucumber.

Hirsute. Root annual. Stem 3–6 feet long, branching; tendrils simple. Leaves 3–4 inches in length, deeply sinuate-lobed; petioles 1–2 inches long. Flowers greenish yellow, on short axillary peduncles. Fruit usually about an inch and a half long, oval, muricate, green.

Gardens: cultivated. Native of Jamaica. Fl. July–August. Fr. September.

Obs. Occasionally cultivated for the young fruit,—which is used for Pickles.

3. CITRUL'LUS, *Neck.* WATER-MELON.

[From *Citrus*, an Orange; the pulp being mostly Orange red.]

Calyx deeply 5-cleft,—the segments linear-lanceolate. *Petals* 5, connected at base, adnate to the bottom of the calyx. *Stamens* 5, inserted on the base of the corolla, triadelphous. *Style* cylindric, trifid; *stigmas* convex, reniform-cordate. *Fruit* sub-globose, fleshy, the placentæ mostly very succulent. *Seeds* numerous, colored, obovate-oblong, compressed truncate at base and obtuse on the margin.

1. *C. VULGA'RIS*, *Schrad.* Stem prostrate, rather slender; leaves somewhat 5-lobed, the lobes obtusely sinuate-pinnatifid, bluish glaucous beneath; flowers solitary, pedunculate, with a single bract; fruit globose or oval, very smooth, stellate-maculate.

COMMON CITRULLUS. Water-melon.

Fr. Melon d'eau. Germ. Die Wasser Melone. Span. Sandia.

Plant hairy. Root annual. Stem 8–12 or 15 feet long, angular, somewhat branching, tendrils branched. Leaves 3–5 or 6 inches long, ovate in their outline; petioles 2–3 inches long, generally erect. Flowers axillary, on hairy peduncles an inch or more in length. Corolla pale greenish yellow. Fruit 10–20 inches long, globose or oval, with a firm fleshy rind, and, when mature, with a tender sweet watery pulp within, which is usually purple or reddish orange-colored (sometimes nearly white). Seeds black or purplish brown.

Gardens and fields: cultivated. Native of India and Africa. Fl. June–August. Fr. August–September.

Obs. This plant—so well known for its delicious fruit—is extensively cultivated,—but succeeds best in the sandy soils along the Atlantic coast, or on the alluvial banks of our Western waters. There is a nearly allied plant, often seen in gardens, which bears a considerably different fruit—known by the name of “Citron,” the firm rind of which is used in making “Sweet meats” or Preserves. The flesh is very firm, and the centre does not become red, tender nor watery, like the common Water-melon: yet the whole aspect of the plant, and external appearance of the fruit, so closely resemble this species, that I suppose it may be nothing more than a variety: perhaps the *var. Pasteca*, *Ser.*

4. SICYOS, L. ONE-SEEDED STAR-CUCUMBER.

[The ancient Greek name for the Cucumber.]

Petals 5, united below into a bell-shaped or flattish corolla. *Stamens* 5, all cohering. *Ovary* 1-celled; *style* slender; *stigmas* 3. *Fruit* ovate, compressed, dry and membranaceous, filled by a single seed, beset with barbed prickles. Climbing *annuals*, resembling the common Cucumber vine: *fruit* in capitate clusters.

1. *S. angula'tus*, L. Leaves cordate at base, angulate 5-lobed; fruit prickly and villous in small, dense, pedunculate clusters.

ANGULATE SICYOS. One-seeded star-cucumber.

Viscid pubescent. Stem 15 - 20 feet long, slender, branching; *tendrils* somewhat umbellately branched. *Leaves* 3 - 5 or 6 inches long, and about as wide as long; *petioles* 2 - 3 inches in length. *Flowers* greenish-white, clustered on axillary *common peduncles* 1 - 5 inches in length, the *staminate* ones corymbose capitate with the peduncle longer; the *pistillate* ones in dense capitate clusters. *Fruit* compressed, ovate in stellately-globose heads, which are about an inch in diameter, and armed with slender tawny spines.

River banks. July - Sept.

Obs. This cucumber-like Vine has found its way into gardens where it is a nuisance rather difficult to get rid of. It is, according to Dr. Short, a great pest in the rich corn-fields of Kentucky, "springing up after the crop 'is laid by' and so extending from one corn-stalk to another as to make it extremely difficult to pass through the field." The Balsam Apple (*MOMORDICA BALSAMINA*, L.), the red fruit of which, made into a tincture, was formerly used as an application to wounds, belongs to this section and is sometimes cultivated in gardens.

** *Petals* united with each other and with the calyx.



FIG. 95. The one-seeded Star-cucumber (*Sicyos angulatus*).

5. CUCURBITA, L. SQUASH AND PUMPKIN.

[The Latinized Celtic name for a Gourd or hollow vessel.]

Calyx-tube ovoid club-shaped ; limb circumcised and deciduous. *Corolla* bell-shaped. *Fruit* fleshy or finally hard and somewhat woody. *Seeds* white, obovate, convexly compressed, the margin scarcely tumid. *Trailing annuals* with subcordate leaves, branching tendrils and yellow axillary subsolitary flowers.

* *Fruit always fleshy.*

1. C. PE'PO, L. Leaves obtusely cordate, somewhat 5-lobed ; fruit subglobose oblong or clavate, smooth, always fleshy.

Pumpkin.

Fr. La grosse Citrouille. Potiron.

Rough and hispid. *Root* annual. *Stem* 10-20 or 30 feet long, sparingly branched ; *tendrils* branched. *Leaves* 9-15 or 18 inches in length ; *petioles* 3-6 or 8 inches long. *Flowers* yellow, large, axillary,—the staminate ones often solitary on a long peduncle. *Fruit* of various forms, sizes and colors,—the flesh of the rind usually yellow, the cavity loosely filled with a yellow stringy pulp.

Fields and lots : cultivated (usually with Indian Corn, in Pennsylvania). Native of the East. *Fl.* July. *Fr.* October.

Obs. Extensively cultivated for its fruit,—of which there are many varieties ; some of them attaining to an enormous size (2 feet or more in diameter),—but these are not so valuable. The better sorts are often used at table,—affording the celebrated Pumpkin Pie of New England ; and the coarser varieties are esteemed for feeding stock. When growing in the immediate vicinity of Squashes, the fruit of this species is liable to be converted into a Hybrid, of little or no value. I have had a crop of Pumpkins totally spoiled, by inadvertently planting Squashes among them,—the fruit becoming very hard and warty—unfit for the table, and unsafe to give to cattle.

** *Fruit finally becoming subligneous.*

2. C. ME'LOPEPO, L. Leaves subcordate, somewhat 5-angled ; fruit mostly orbicular and much depressed, with the margin often tumid and torulose, at first fleshy, finally subligneous.

Round Squash. Cymling.

Fr. Bonnet de Prêtre. Pastisson.

Hirsute. *Root* annual. *Stem* 8-12 or 15 feet long, somewhat branching ; *tendrils* branched,—sometimes transformed or developed into imperfect leaves. *Leaves* 6-8 inches long ; *petioles* as long as the leaves. *Flowers* yellow, rather large, pedunculate. *Fruit* of various colors (mostly yellow, pale green, or mottled), smooth or sometimes warty,—the rind finally hard and woody, containing a loose stringy pulp.

Fields and gardens : cultivated. Native country uncertain. *Fl.* July. *Fr.* October.

Obs. Cultivated for the young fruit,—which is generally esteemed, as a vegetable sauce. There are numerous varieties of the fruit—and of various qualities. There is also a kind of stunted variety of the plant, with a short bushy stem, which is often a prolific bearer.

3. *C. verrucosa*, L. Leaves deeply 5-lobed, the middle lobe narrowed at base; fruit elliptic-oblong, or clavate and often arcuate, verrucose.

WARTY CUCURBITA. Warted Squash. Long-necked Squash.

Hirsute. Root annual. Stem 10–15 feet long, somewhat branching; tendrils branched. Leaves 8–10 inches long; petioles nearly as long as the leaves. Flowers yellow, rather large. Fruit varying from oblong to obovoid and clavate, often much elongated and curved, rough with warts or obtuse tubercles, and of various colors, or shades, from yellow to green and white, finally hard and subligneous or bony.

Lots and gardens: cultivated. Native country unknown. Fl. July. Fr. October.

Obs. Cultivated as the preceding (to which it is nearly allied),—and for the same purposes. Both species are apt to produce worthless Hybrids among Pumpkins, when growing near them; and therefore should never be planted in their immediate vicinity.

ORDER XXXI. SAXIFRAGA'CEÆ. (SAXIFRAGE FAMILY.)

Herbs or shrubs, with alternate or opposite, sometimes stipulate leaves, and various, often cymose inflorescence. Sepals 4–5, persistent, more or less connected with each other, and often more or less adherent to the ovary. Petals as many as the sepals,—rarely wanting. Stamens as many—or more commonly twice as many as the petals, and inserted with them into the throat of the calyx. Ovaries mostly 2, cohering at base and distinct at summit. Fruit capsular. Seeds numerous; embryo straight, in the axis of fleshy albumen.

An unimportant Order to the Agriculturist,—though some species of *Hydrangea* and *Philadelphus* are admired, and cultivated as Ornamental Shrubs.

1. SAXI'FRAGA, L. SAXIFRAGE.

[Latin, *Saxum*, a rock, and *frangere*, to break; the plant often growing in clefts of rocks.]

Calyx 5-parted, often adnate to the base of the ovary. Petals 5, entire. Stamens mostly 10 (rarely 5). Capsule usually 2-beaked,—or rather consisting of 2 acuminate connate carpels, opening between the diverging beaks. Radical leaves usually rosulate; cauline ones mostly alternate.

1. *S. PENNSYLVANICA*, L. Leaves all radical, oblanceolate or oval, rather acute, obsolete denticulate, tapering at base to a broad margined petiole; scape leafless, striate, pubescent; cymes in an oblong panicle; flowers pedicellate; petals linear-lanceolate, scarcely twice as long as the calyx; ovary nearly free.

PENNSYLVANIA SAXIFRAGE. Tall Saxifrage.

Root perennial, with coarse fibres. Leaves 4–6 or 8 inches long, thin and smoothish, somewhat ciliate. Scape 2–3 (occasionally 4–5) feet high, rather stout, sulcate-striate. Cymes at first in conglomerate heads—finally rather loose, in an oblong open panicle 12–18 inches in length,—the branches glandular-pubescent and somewhat viscid. Petals greenish yellow, small. Stamens persistent; anthers orange-colored with a tinge of purple. Seeds angular, dark brown.

Swampy meadows and low ground: Canada to Virginia and Ohio. Fl. May. Fr. July.

Obs. There are numerous species of Saxifrage on this continent, (a white-flowered one,—viz.: *S. Virginiensis*, Mx. is very common on rocky banks, in the woodlands of the middle States): but this is the only

one which, by its size, and frequent occurrence in wet meadows, is likely to attract the notice of the farmer. It is a mere weed, but not difficult to get rid of, by draining and proper attention. The **Heuchera Americana**, L., or Alum-root—a plant belonging to this order, is frequent along fence-rows and borders of rich woodlands,—and its astringent root has been of some notoriety as an Indian remedy for cancerous sores: but it is scarcely of sufficient prominence, on the farm, to command the attention of the Agriculturist.

ORDER XXXII. HAMAMELA'CEÆ. (WITCH-HAZEL FAMILY.)

Shrubs or trees with alternate, simple leaves, deciduous stipules and polygamous or monœcious flowers in heads or spikes. Calyx cohering with the base of the ovary. Pistils 2, united below. Fruit a 2-beaked 2-celled woody pod, opening at the summit with one or two bony seeds in each cell; embryo large in a sparing albumen; petals sometimes wanting.

* *Flowers with calyx and corolla, and a single ovule suspended from the summit of each cell.*

1. HAMAME'LIS, L. WITCH-HAZEL.

[Greek, *Hama*, like to, and *Melis*, an apple tree; application not obvious.]

Flowers in little axillary clusters, with an involucre of 3 scale-like leaflets; calyx 4-parted, with 2 – 3 bractlets at base. Petals 4, long and linear. Stamens 8, very short; the 4 alternate with the petals having anthers, the others imperfect and scale-like. Capsule opening loculicidally from the top; the outer coat separating from the inner, which encloses the large and bony seed in each cell, but soon bursts elastically into two pieces.

1. H. Virgin'ica, L. Leaves obovate or oval, sinuate-dentate, subcordate at base, stellately pubescent.

VIRGINIAN HAMAMELIS. Witch-hazel.

Stem 6–12 feet high, with straggling flexuose branches. Leaves 2–6 inches long; petioles about half an inch in length. Flowers greenish-yellow, clustered in threes, on a common peduncle near half an inch long; petals narrow, linear, a little crisped, about $\frac{3}{4}$ of an inch in length. Seeds black and shining.

Damp woods. Fl. October, the fruit perfecting in the September following.

Obs. This shrub is worthy of cultivation by the curious, on account of the singular lateness of its flowers, which appear at the time when most trees are shedding their leaves. The flowers are often seen as late as November, when the leaves have all fallen. It is said to grow readily in a moist situation. The twigs of the Witch-hazel were used in the days of superstition and witchcraft as divining rods, to indicate the position of hidden springs of water or deposits of precious ores,—a belief in their efficacy is not even now wholly extinct. *

** *Flowers naked, with barely the rudiments of a calyx, and no corolla, crowded in catkin-like heads. Ovules several or many in each cell.*

2. LIQUIDAM'BAR, L. (SWEET-GUM.)

[Name compounded from Latin, *Liquidus*, fluid, and Arabic, *Ambar*, amber ; in allusion to a fragrant liquid that sometimes exudes from the tree.]

Flowers usually monœcious, in globular heads or catkins ; *sterile flowers* in conical clusters, naked ; stamens numerous, intermixed with minute scales. *Fertile flowers* consisting of many 2-celled, 2-beaked ovaries, subtended by minute scales in place of a calyx, all more or less cohering and hardening in fruit, forming a spherical head ; the *Pods* opening between the 2 awl-shaped beaks. *Styles* 2, stigmatic down the inner side. *Ovules* many, but only one or two perfecting. *Seeds* with a wing-angled seed-coat. *Catkins* racemed, nodding in the bud enclosed by a 4-leaved deciduous involucre.

1. *L. styraci'flua*, L. Leaves rounded, deeply 5 – 7-lobed, smooth and shining, glandular-serrate, the lobes pointed.

Sweet Gum. Bilsted.

A large *tree*, 60 – 70 feet high and 2 or more feet in diameter ; the corky layer of the bark often developed in ridges on the smaller branches. *Leaves* 3 – 5 inches in diameter, so deeply lobed as to appear star-shaped, fragrant when bruised. *Fruit* a globose prickly head, an inch or more in diameter.

Woods. Connecticut, southward. *Fl.* April. *Fr.* September.

Obs. One of our finest forest trees, and deserving of more attention than it has yet received. It is especially conspicuous in autumn, when its beautiful star-shaped leaves assume a deep crimson color. The wood is fine-grained but warps readily, and soon decays when exposed to moisture. The balsamic liquid, from which the tree receives both its generic and specific names, does not seem to be developed at the north. It has been obtained from trees growing in the warm parts of the Union : it is an aromatic liquid, having the consistence of honey, and has the stimulant qualities of the Storax of the shops. *

ORDER XXXIII. UMBELLIF'ERÆ. (PARSLEY FAMILY.)

Herbs with usually hollow and furrowed *stems*, alternate, generally much dissected *leaves* with *petioles* more or less dilated and sheathing at base, and *flowers* in usually *involucrate umbels*. *Calyx* entirely adherent to the ovary, the limb obsolete or merely a toothed border. *Stamens* and petals 5, inserted, alternately in the disk that crowns the ovary and surrounds the base of the 2 *styles* ; *petals* mostly with an inflexed point. *Fruit* of 2 seed-like dry carpels (*mericarps*), cohering by their inner face, marked with 5 *primary ribs* and often with 5 intermediate (*secondary*) ones ; the spaces between the ribs often containing receptacles of aromatic oil (*oil-tubes*). *Seeds* solitary, suspended ; *embryo* minute, in the apex of copious horny *albumen*.

The plants of this family can only be satisfactorily studied with the full-grown fruit. The number of oil-tubes is best seen by making a slice across the fruit and examining it with a magnifier.

This large and important Order comprises about 200 genera,—and is remarkable for the aromatic and generally harmless character of the fruit—while the herbage (including root, stem and leaves), is often highly deleterious. The species best known on the farm, and in the kitchen-garden, are here noticed. Some medicinal gums are furnished by this Order, such as *Asafoetida*, *Galbanum* and *Ammoniac*.

Inner face of the seeds flat (not hollowed out), where the two halves of the fruit join.

Fruit with long prickles. Umbel becoming concave.

Fruit not prickly but winged on the margin.

Flowers yellow. All alike.

Flowers white, the outer corollas larger.

Flowers white, all alike; leaves pinnate or 3-foliolate.

Fruit neither prickly nor winged on the margin.

Flowers yellow; leaflets long and narrow.

Flowers white.

Umbels usually without involucre or involucels.

Divisions of the leaves very slender.

Divisions or leaflets wedge-shaped.

Divisions or leaflets ovate or lanceolate.

Umbels with 3-leaved involucels but no involucre.

Umbels with both involucre and involucels.

Leaves decomposed, finely divided.

Leaves 2-3 times compound; leaflets coarse.

Inner face of the seed grooved or hollowed out down the whole length of the inner face.

Leaves finely cut, with an unpleasant odor.

Inner face of the seed curved in at the top and bottom.

Flowers white.

1. DAUCUS.

2. PASTINACA.

3. HERACLEUM.

4. ARCHEMORA.

5. FOENICULUM.

6. CARUM.

7. APIUM.

8. ÆGOPodium.

9. ÆTHUSA.

10. PETROSELINUM.

11. CICUTA.

12. CONIUM.

13. CORIANDRUM.

1. DAU'CUS, *Tournef.* CARROT.

[*Daukos*, the ancient Greek name of the Carrot.]

Calyx 5-toothed. *Corolla* irregular. *Fruit* ovoid oblong, somewhat dorsally compressed. *Carpels* with the 5 primary ribs slender and minutely bristly, the 4 secondary ribs equal, prominently winged, and each pectinately cleft into a single row of prickles with an oil tube under each of them. *Involucre* many-leaved; leaflets pinnatifid. *Involucels* many-leaved; leaflets trifid or entire. *Biennials* with leaves bi- or tri-pinnately dissected.

1. *D. Caro'ta*, L. Stem hispid; leaves 2-3-pinnatifid; segments pinnatifid, the lobes lanceolate and cuspidate; leaflets of the involucre nearly as long as the umbel; prickles about equal to the diameter of the oblong-oval fruit.

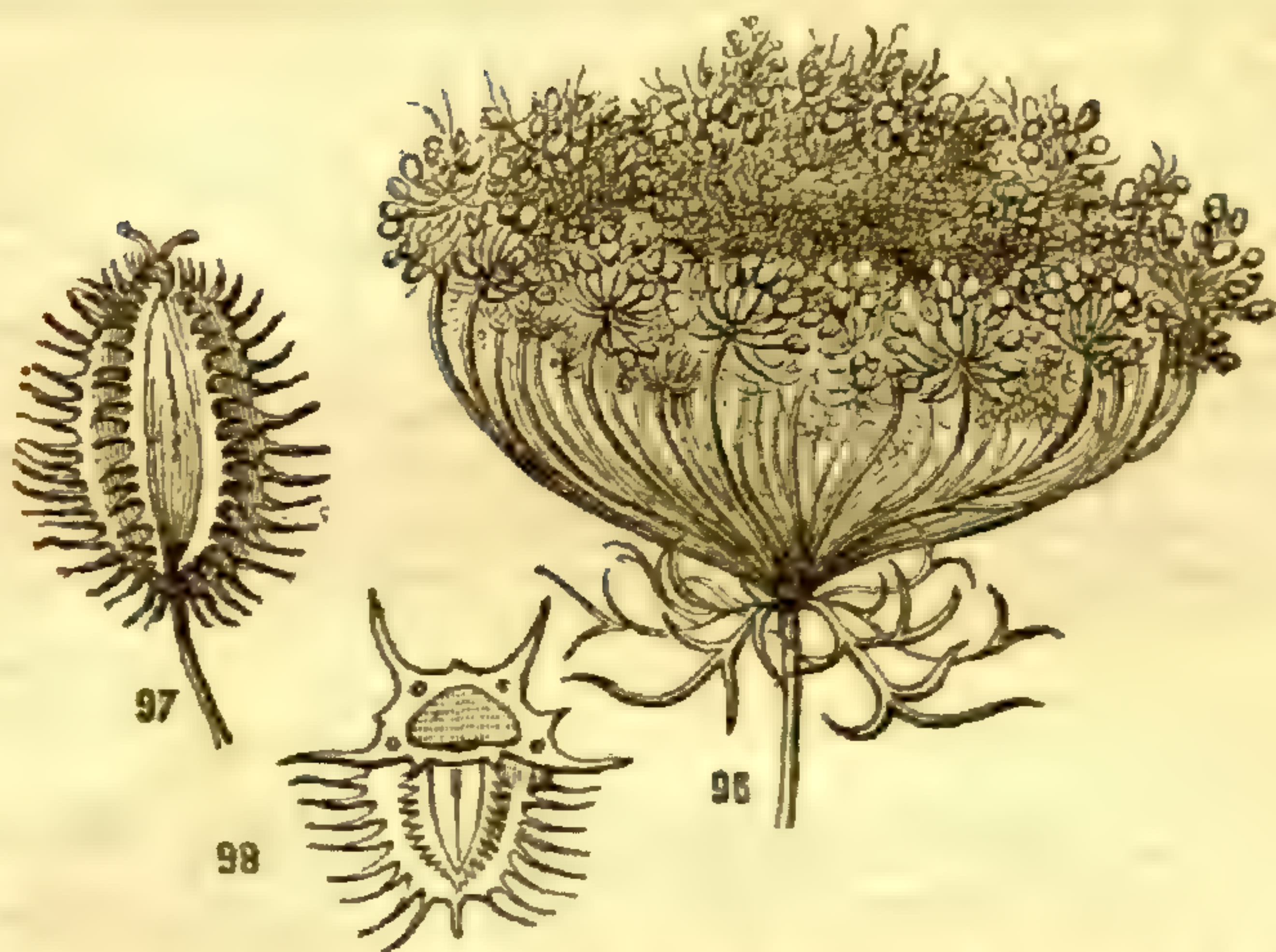
CARROT DAUCUS. Carrot. Wild Carrot.

Fr. Carotte. *Germ.* Die Moehre. *Span.* Zanahória.

Plant greyish-green, hispidly pilose. *Root* fusiform, yellowish or orange-colored. *Stem* 2-3 or 4 feet high, rather slender, terete, sulcate-striate, branching. *Leaves* twice or thrice pinnatifid; segments half an inch to an inch long, much incised. *Umbels* on long peduncles or naked branches, nearly level on the top when in flower—concave when in fruit. *Petals* white or ochroleucous—occasionally with a purplish tinge—the central floret of the umbel often abortive, with fleshy dark purple petals. *Fruit* very hispid, the prickles on the secondary ribs somewhat barbed.

Gardens, fields and road-sides: introduced. Native of Europe and the East. *Fl.* July - Sept. *Fr.* Sept. - October.

Obs. The var. SATIVA, DC., or common Garden Carrot—with a large fleshy yellow or reddish orange-colored root—is much cultivated as a culinary vegetable, for soups, &c. In Europe, it is highly esteemed as a food for Milch Cows, and other stock, during winter; but in this country, the root culture, for such objects, is but little attended to, probably less than it ought to be. The wild variety is extensively natu-



ralized, and threatens to become a troublesome pest, on our farms. When it gets on the premises of a careless slovenly farmer, it soon multiplies so as to become a source of annoyance to the whole neighborhood. It should be diligently eradicated before it matures its seeds.

2. PASTINA'CA, Tournef. PARSNIP.

[Latin, *Pastus*, food ; from the use made of the root.]

Calyx-teeth obsolete. *Fruit* oval, flatly compressed, with a dilated flat margin. *Carpels* ribbed as in *Heracleum*. *Oil-tubes* one in each channel between the ribs, and two on the inner face of the carpel, as long as the carpels. *Involucre* and *involucels* 0, or few-leaved. *Stem* sulcate, smooth. *Leaves* pinnately dissected ; the *leaflets* incised-dentate or lobed.

1. *P. SATI'VA*, L. *Leaflets* in 3-4 pairs with a terminal odd one, ovate-oblong, rather obtuse, incised-dentate, sessile ; the terminal one 3-lobed and petiolulate.

CULTIVATED PASTINACA. Parsnip. Garden Parsnip.

Fr. Panais potager. Germ. Die Pastinake. Span. Chirivia.

Plant yellowish green. *Root* biennial, fusiform, large and fleshy. *Stem* 3-5 feet high, rather stout, furrowed and fistular, somewhat branching. *Leaflets* 2-4 inches long—the primary leaves of the young plant orbicular-cordate and incisely crenate. *Umbels* nearly level on the top. *Petals* yellow, small, with the apex incurved or rolled in. *Fruit* thin or very flatly compressed on the back. *Ribs* filiform ; *channels* greenish-yellow ; *oil-tubes* dark purple, generally linear, sometimes a little clavate.

Gardens ; cultivated. Native of Europe. Fl. June - August. Fr. August - October.

Obs. Generally cultivated for its fine esculent root, which, in the best varieties (such as that called the "Guernsey Parsnip"), is remarkably rich and marrow-like. The plant produces many seeds, and is apt to

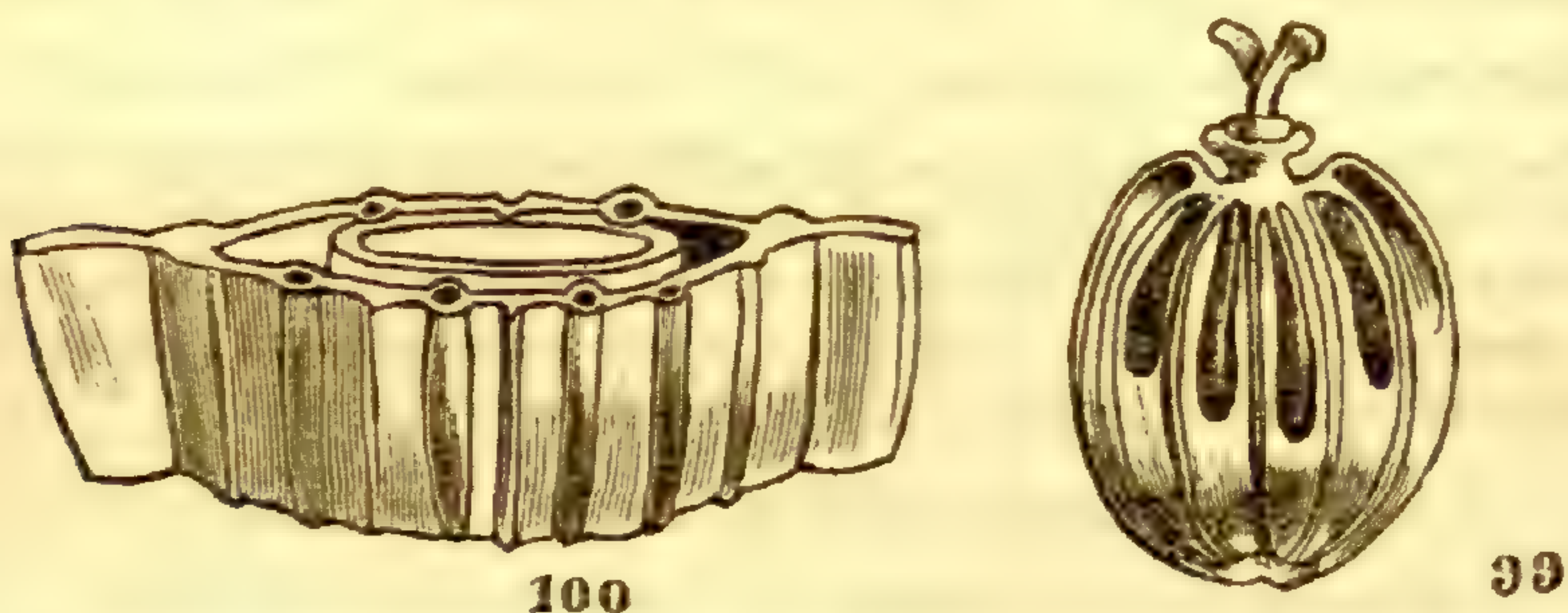
FIG. 96. An umbel of the Carrot [*Daucus Carota*]. 97. An enlarged fruit. 98. The same divided, showing an oil-tube under each of the prickly secondary ribs.

stray from the garden into the fields, where it speedily degenerates, and, if neglected, becomes a troublesome unsightly weed.

3. HERACLE'UM, L. COW-PARSNIP.

[Dedicated to Hercules.]

Fruit broadly winged-margined; *carpels* slenderly 5-ribbed, the lateral ones close to the margin; *oil-tubes* shorter than the carpels. Stout *perennials*; *leaves* large, ternately dissected; *petioles* broad and sheathing; *umbels* flat, large, the *outer flowers* commonly larger and appearing 2-cleft; *involucre* few-leaved, deciduous; *involucels* many-leaved.



H. lana'tum, *Mx.* Woolly; stem sulcate; segments of the leaves broad, palmate-lobed, subcordate at base.

WOOLLY HERACLEUM. Cow-parsnip. Masterwort.

Stem 4–8 feet high, branched above. *Segments of the leaves* 4–10 or 12 inches in length and as wide as long, the middle one often 3-lobed; *petioles* 1–4 inches long. *Umbels* sometimes a foot or more in breadth, the rays 2–6 inches long. *Involucels* of 5–8 leaves, which are lanceolate, with a long slender point. *Flowers* white.

Rich low grounds. More common northward. May–July.

Obs. This very conspicuous strong-scented plant is sometimes used in medicine. The seeds are aromatic. The root is very acrid when fresh, and produces blisters when applied to the skin. Much of its acridity is lost by drying, and in this state it is used as a stimulant. The plant has a doubtful reputation, and should be used with caution.

4. ARCHEM'ORA, DC. COW-BANE.

[Named from *Archemorus*,—who, it is said, died from eating Parsley.]

Calyx 5-toothed. *Fruit* elliptic-ovate, convex or lenticularly compressed. *Carpels* with 5 equidistant obtuse ribs, the lateral ones dilated into a flattish thin-edged margin. *Oil-tubes* one in each channel, and 4–6 on the inner face. *Involucre* 0 or few-leaved. *Involucels* many-leaved. *Stem*

FIG. 99. Fruit of the Cow Parsnip (*Heracleum lanatum*,) in which the oil-tubes do not fill the whole length of the channels. 100. The same cut across, both enlarged.

terete, striate. *Leaves* pinnately or ternately dissected, the rather rigid leaflets entire or sparingly toothed near the apex.

1. *A. rig'ida*, DC. Leaflets 3 – 9, sessile, oblong-lanceolate, very entire or remotely incised-dentate near the apex; umbels terminal and subterminal, on long peduncles.

RIGID OR STIFF ARCHEMORA. Cow-bane. Wild Parsnip.

Whole plant smooth. *Root* perennial. *Stem* 2 – 4 or 5 feet high, rather slender, sparingly branched above. *Leaves* all simply pseudo-pinnate; *common petioles* 1 – 5 or 6 inches long, channeled and somewhat margined; *leaflets* or segments 2 – 3 or 4 inches long—varying from linear to ovate-lanceolate and cuneate-oblong, often a little falcate. *Umbels* about 3, on rather long sulcate-striate peduncles. *Involucre* 0, or sometimes of 2 – 3 lance-linear leaflets. *Involucels* of 6 – 8 subulate-linear leaflets. *Petals* white. *Channels* filled to convexity by the dark purple *oil-tubes*. Inner face of the carpels a little concave, lined with a white corky coat.

Swampy meadows and low grounds: New York to Louisiana. *Fl.* August. *Fr.* Oct.

Obs. This is reputed to be an active poison, particularly to horned cattle, when eaten by them; and therefore every farmer is interested in knowing the plant, and causing it to be eradicated from his meadows and pastures. It varies somewhat in its features; but the above is a description of its usual form, in Pennsylvania.

5. FÆNIC'ULUM, Adans. FENNEL.

[Latin, diminutive of *Fœnum*, hay; from a resemblance in its odor.]

Fruit elliptic-oblong, subterete. *Carpels* with 5 obtuse keeled ribs, of which the lateral ones are marginal, and often a little broader. *Channels* with single *oil-tubes*. *Involucre* and *involucels* 0. Biennial or perennial. *Stems* terete, striate. *Leaves* decompose, pinnately dissected, the segments linear. *Flowers* yellow.

1. *F. vulga're*, Gaertn. Segments of the leaves subulate-linear, elongated; umbels many-rayed.

COMMON FÆNICULUM. Fennel. Garden Fennel.

Fr. Fenouil. *Germ.* Der Fenchel. *Span.* Hinojo.

Plant smooth. *Root* perennial? (biennial, DC.). *Stem* 4 – 5 or 6 feet high, branching, striate-grooved, purplish-green and somewhat glaucous; *leaves* large, finely and somewhat biternately dissected; *segments* an inch to an inch and a half long, almost filiform, the subdivisions often dichotomous; *common petioles* much dilated, sheathing, produced into 2 marginal lobes at summit. *Umbels* of 15 – 20 or 30 unequal rays.

Gardens: cultivated. Native of Europe. *Fl.* July. *Fr.* September.

Obs. The whole plant is highly aromatic. Those who kept Bees, in former years, were much in the practice, when those insects swarmed, of rubbing the inside of the bee-hive with this fragrant herb, under the impression that the odor would attach them to their new domicile. It is chiefly cultivated for its aromatic fruit, which is occasionally used in domestic economy; and is sometimes smoked, like tobacco, as a popular remedy for cholic. Those who have read the charming pictures of early New England life, in "Goodrich's Recollections of a Lifetime," will recollect the mention of the custom of the old ladies to carry to church

with them sprigs of fennel to keep them awake during the long sermon, a practice which is not entirely obsolete. In the more primitive portions of the country, the patch of fennel may still be seen growing, and the sanctuary is still redolent of its odors. *

6. CA'RUM, Koch. CARAWAY.

[Said to be derived from *Caria*—the native country of the plant.]

Fruit ovate or oblong. *Carpels* with 5 filiform equal ribs. *Channels* with single *oil-tubes*. *Involucre* and *involucels* mostly wanting. *Stems* striate, smooth. *Leaves* pinnately dissected; segments multifid. *Flowers* white.

1. C. CA'RUI, L. Leaves somewhat bipinnatifid, the segments linear; involucre 1-leaved or 0; involucels 0.

CARIAN CARUM. Common Caraway.

Fr. Carvi. *Germ.* Gemeiner Kuemmel. *Span.* Alcaravéa.

Root biennial? (perennial, DC.), fusiform. *Stem* about 2 feet high, branched. *Radical leaves* rather large; *stem leaves* multifid, the segments filiform. *Petals* white. *Fruit* oblong or elliptic, often oblique at apex.

Gardens: cultivated. Native of Europe. *Fl.* June. *Fr.* August.

Obs. This is sometimes cultivated for its highly aromatic fruit,—which is used to impart a flavor to cakes, and other articles of cookery.

7. A'PIUM, L. CELERY.

[From the Celtic, *Apon*, water; near which it naturally grows.]

Fruit roundish. *Carpels* with 5 filiform equal ribs. *Channels* with single *oil-tubes*, the outer ones often with 2–3. *Involucre* and *involucels* 0. *Stems* sulcate. *Leaves* pinnately dissected, with wedge-shaped divisions.

1. A. GRAVE'OLENS, L. var. dulce. Lower leaves on very long petioles; segments cuneate, lobed.

STRONG-SCENTED APIUM. CELERY.

Fr. Céléri. *Germ.* Der Celeri. *Span.* Apio hortense.

Whole plant glabrous. *Root* biennial, fusiform. *Stem* 2–3 feet high, branching. *Radical leaves* on stout succulent channeled petioles, 6–12 inches or more in length, and which are green, or often purplish, when not artificially blanched; *stem leaves* on short petioles. *Umbels* terminal and axillary,—the axillary ones often subsessile; *rays* unequal, spreading. *Petals* greenish-white. *Fruit* nearly orbicular.

Gardens: cultivated. Native of Europe. *Fl.* July. *Fr.* September.

Obs. This is much cultivated for the sake of the succulent spicy petioles of the radical leaves,—which are used as a salad: but in order to be rendered palatable—or even eatable—they require to be blanched or etiolated by the exclusion of light,—which is usually effected by planting in trenches and covering them with earth. The var. rapaceum, DC., or Turnip-rooted Celery, is also cultivated,—though not so commonly.

8. *ÆGOPO'DIUM*, L. GOAT'S-FOOT.

[Greek, *Aix*, a goat, and *podion*, a little foot.]

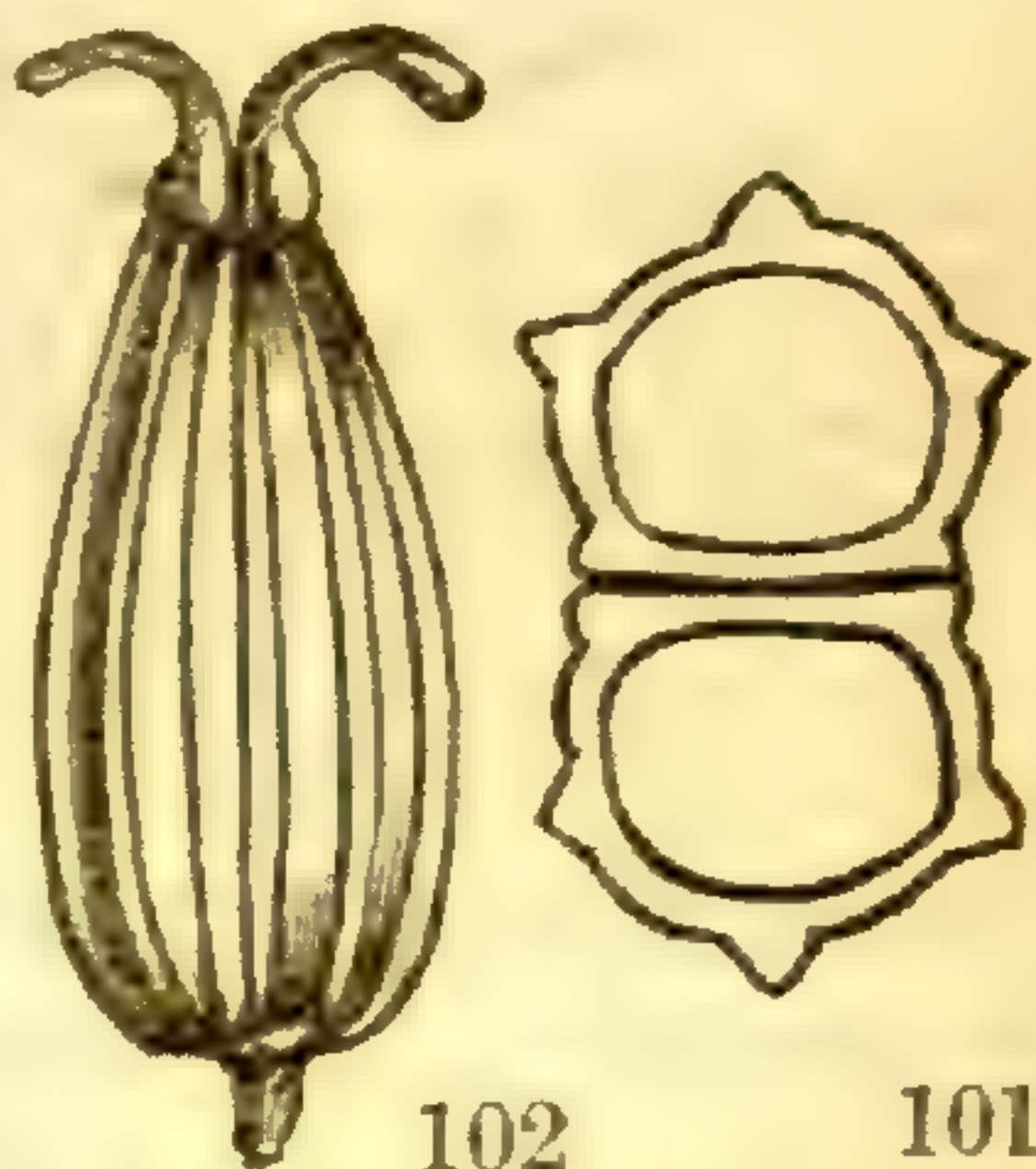
Fruit oblong, crowned with the conical bases of the deflexed styles. *Carpels* with 5 slender ridges, without oil-tubes. *Leaves* ternate or bi-ternate with broad pointed serrated leaflets. *Involucres* and *involucels* none.

1. *Æ. Podagra'ria*, L. Root perennial, creeping extensively; stems robust, hollow, furrowed, glabrous; leaflets ovate or lanceolate, acuminate unequally toothed; the lower leaves on long petioles; the upper merely 3-cleft; umbels many-rayed; petals white.

Goat's-foot. Goat-weed. Herb Gerarde.

Stem about a foot and a half high. *Fruit* very seldom perfected.

Obs. This, which is considered an exceedingly troublesome weed in England, has made its appearance in some parts of Pennsylvania, and proves to be a nuisance not easily abated. It has hitherto resisted all attempts to get rid of it; Don, in his General System of Gardening, &c., says that "being a great creeper it cannot be admitted into gardens, for after it gets hold it is next to impossible to eradicate it again." The leaves are said to be used in the same manner as Parsley, which accounts for Don's cautioning against introducing it. Such an invader should be carefully watched and its spread arrested.



9. *ÆTHU'SA*, L. FOOL'S PARSLEY.

[Greek, *aitho*, to burn; on account of its acrid qualities.]

Calyx teeth obsolete. *Fruit* ovate globose; the *carpels* each with 5 thick, sharply-keeled ridges: intervals with single *oil-tubes*. *Annual* erect poisonous herbs with 2-3 ternately compound and many cleft *leaves*. *Involucre* none; *involucels* 1-3 leaved. *Flowers* white.

1. *Æ. Cyna'pium*, L. Segments of the leaves wedge-lanceolate; involucels 3-leaved, long and narrow.

Fool's Parsley.

Stem 1-2 feet high, hollow not spotted. *Leaves* with ultimate lobes linear-lanceolate. *Umbels* terminal and opposite the leaves; rays very unequal, the longest scarcely an inch in length. *Involucels* 1-sided. *Fruit* nearly as broad as long, with very prominent ribs.

Cultivated grounds and waste places. Native of Europe. July-September.

Obs. This poisonous plant is naturalized in New England; it somewhat resembles the Poison Hemlock, from which it is distin-



FIG. 101. Fruit of the Goatsfoot [*Ægopodium Podagraria*]. 102. A section.
FIG. 103. The fruit of Fool's Parsley. 104. The same, cut across. 105. A petal with the point bent inward.

guished by its unspotted stem, the long pendulous one-sided involucels and the straight ridges of the fruit.

10. PETROSELI'NUM, Hoffm. PARSLEY.

[Greek, *Petra*, rock, and *Selinum*; Rock Selinum,—from its native habitat.]

Fruit ovate. *Carpels* with 5 equal ribs. *Channels* with single *oil-tubes* and two on the inner face of the carpels. *Involucre* few-leaved. *Involucels* many-leaved. *Stems* somewhat angular. *Leaves* decompose.

1. *P. SATI'VUM*, Hoffm. Segments of the lower leaves cuneate-ovate, trifid and incised-dentate,—of the upper ones linear-lanceolate and nearly entire; involucels subulate.

CULTIVATED PETROSELINUM. Parsley.

Fr. Persil. *Germ.* Die Petersilie. *Span.* Perexil.

Plant smooth. *Root* biennial. *Stem* 2-4 feet high, striate with green and yellowish stripes, branched. *Leaves* shining green, the lower ones much dissected. *Umbels* terminal and axillary, pedunculate. *Involucre* of a single leaflet (or sometimes 2-3) linear. *Involucels* of 5-6 short subulate leaflets. *Petals* greenish-white. *Fruit* ovate.

Gardens: cultivated. Native of Eastern Europe. *Fl.* June. *Fr.* August.

Obs. Cultivated for the pleasant-flavored leaves which are used in culinary processes. The root has long been a popular diuretic. The var. *CRISPUM*, or Curled Parsley—with the segments of the lower leaves broader, and curled on the margin—is also frequent in kitchen gardens.

11. CICU'TA, L. WATER-HEMLOCK.

[Latin name of the Hemlock.]

Calyx with 5 minute teeth. *Fruit* roundish. *Carpels* with 5 equal flat-tish ribs, with a single *oil-tube* in each interval. *Involucre* few-leaved. *Involucels* many-leaved. Sub-aquatic herbs. *Stem* terete, smooth, fistular. *Leaves* tripinnately or triterately dissected.



106



107

1. *C. macula'ta*, L. Stem spotted or streaked; leaves bi- or tri-ternately divided,—the segments lanceolate, mucronately serrate, the nerves terminating in the notches.

SPOTTED CICUTA. Spotted Cow-bane. Water Hemlock.

Root perennial, with thick oblong fleshy fibres. *Stem* 4-6 feet high, branching, dark purple, or striate with green and purple or brown; *leaves* smooth, the lower ones on rather long petioles, ternately dissected with the terminal

division mostly in fives; *segments* or leaflets 2-3 inches long, petiolulate, penninerved—the nerves (as remarked by Dr. BIGELOW,) running to the notches of the serratures instead of the points. *Umbels* spreading; rays slender. *Involucre* 0 or 1-2 linear leaflets. *Involucels* of 5-6 small lance-linear leaflets. *Petals* white. *Fruit* nearly round; *ribs* rather broad; *channels* reddish-brown or dark purple, filled with aromatic oily matter.

FIG. 106. The fruit of the Water Hemlock [*Cicuta maculata*]. 107. A section of the same

Swampy grounds and margins of rivulets : throughout the United States. *Fl.* July. *Fr.* September.

Obs. The mature fruit of this plant has a strong anisate odor. The root is an active poison ; and the lives of children, and others, are often endangered and sometimes destroyed by eating it, in mistake for that of the Sweet Cicely (*Osmorhiza longistylis*, DC.)—an aromatic plant of the same natural family. The herbage is also said to be destructive to cattle, when eaten by them · all which goes to show the propriety of possessing sufficient Botanical knowledge to be able to identify the plant—and likewise the necessity of extirpating it from all meadows and pastures.

12. CONI'UM, L. POISON-HEMLOCK.

[From *Koneion*, the Greek name of the Hemlock.]

Fruit ovate, compressed or contracted at the sides. *Carpels* with 5 prominent equal ribs which are undulate-crenulate when immature,—the inner face with a deep narrow groove ; *oil-tubes* none. *Involucre* few-leaved. *Involucels* dimidiate or one-sided, about 3-leaved.

1. *C. macula'tum*, L. Stem terete, spotted ; leaves tripinnately dissected,—segments lanceolate, pinnatifid, the lobes acute and often incised ; leaflets of the involucels lanceolate, shorter than the umbellets.

SPOTTED CONIUM. Common Hemlock.

Fr. Ciguë ordinaire. *Germ.* Der Schierling. *Span.* Ceguda.

Plant smooth, deep bluish green, and sometimes glaucous. Root biennial, fusiform, whitish and fleshy. Stem 2-4 (sometimes 6-8) feet high, fistular, branched, somewhat sulcate, streaked with green and yellow and often spotted with dark purple. Common petioles dilated, nerved with scarious margins. Petals white. Fruit somewhat gibbous. Carpels with the ribs wavy, especially while young—the faces inclining to separate between the base and apex when mature.

Waste places : introduced. Native of Europe. *Fl.* June-July. *Fr.* September.

Obs. This foreigner is partially naturalized in many places,—and being a powerful narcotic poison, it ought to be known by every person on whose premises it may occur. The plant when bruised emits a disagreeable odor. It is supposed to be the herb with which the ancient Greeks put their philosophers and statesmen to death when they got tired of them. An extract prepared from the plant was formerly used for the treatment of scrofula and malignant tumors, but it is now believed that the only benefit, if any, derived from it, was that of a palliative anodyne.

13. CORIAN'DRUM, Hoffm. CORIANDER.

[Greek, *Koris*, a bug ; the bruised leaves having the odor of a bed-bug.]

Fruit globose. *Carpels* cohering, scarcely separating,—each with 5 undulate depressed primary ribs, of which the lateral ones are placed in front of an accessory margin ; the 4 secondary ribs more prominent and



FIG. 108. A branch of the Poison Hemlock [*Conium maculatum*]. 109. An umbellet in fruit. 110. An enlarged fruit. 111. A section of the fruit, without oil-tubes, the seed curved in at the margins.

keeled. *Channels* without *oil-tubes*. *Seed* curved in at top and bottom. *Involucre* 1-leaved or 0. *Involucels* dimidiate, about 3-leaved. *Flowers* white, or tinged red before expanding.

1. *C. SATI'VUM*, L. Leaves bipinnately dissected,—segments of the lower ones broad-cuneate, incised-dentate,—of the upper ones narrow and linear; carpels hemispherical.

CULTIVATED CORIANDRUM. Coriander.

Fr. Coriandre. *Germ.* Der. Koriander. *Span.* Cilantro.

Plant smooth. *Root* annual (sometimes biennial, DC.). *Stem* 1–2 feet high, slender, striate, somewhat branched at summit. *Umbels* 3–5-rayed. *Umbellets* of numerous short unequal rays. *Carpels* very concave on the face, cohering by their margins so as to form apparently a simple globose fruit with 2 oil-tubes in a loose membrane, which covers the inner face of the seed.

Gardens: cultivated. Native of Tartary and the East. *Fl.* June–July. *Fr.* August–September.

Obs. Occasionally cultivated for its aromatic fruit. The odor of the fresh herb is very offensive, notwithstanding which the Tartars are said to prepare a favorite soup from it.

ORDER XXXIV. ARALIA'CEÆ. (GINSENG FAMILY.)

Perennial herbs, shrubs or trees, with alternate, mostly compound leaves, destitute of stipules, and mostly umbellate flowers—the umbels often paniculate. *Calyx* adherent to the ovary,—the limb usually very small, toothed or entire. *Petals* 5, valvate in æstivation. *Stamens* as many as the petals and alternate with them. *Ovary* 3–several united carpels, with a solitary suspended ovule in each cell; *styles* as many as the cells—sometimes united. *Fruit* baccate or drupaceous,—sometimes nearly dry, but the carpels not separating.

A small Order, with much the same characters as Umbelliferae, but with usually more than 2 styles, and the fruit a 3–several-celled drupe.

1. ARA'LIA, L. WILD SARSAPARILLA. GINSENG.

[Name of unknown derivation; supposed to be of Canadian origin.]

Flowers more or less polygamous. *Calyx* 5-toothed, teeth very short or almost obsolete. *Petals* 5, spreading. *Stamens* 5, on short filaments. *Styles* 2–5, mostly distinct and slender, or in the sterile flowers short and united. *Berry* 2–5-celled with a single suspended seed in each cell, somewhat 5-lobed. *Herbs or shrubs*,—sometimes prickly. *Leaves* mostly decomposed. *Flowers* white or greenish, in umbels.

§ 1. *ARALIA*. *Flowers* monœciously polygamous or perfect, the umbels usually in corymbs or panicles; *styles or cells of the (black or dark purple) fruit* 5; *stems* herbaceous or woody; *ultimate divisions of the leaves* pinnate.

1. *A. racemo'sa*, L. Stem herbaceous, smooth, divaricately branched; leaves ternately and quinate decomposed; leaflets cordate-ovate, acuminate, doubly serrate; racemes axillary, compound, paniculately umbellulate; involucels small.

RACEMOSE ARALIA. Spikenard.

Root thick, aromatic. *Stem* 3–5 feet high, with spreading and somewhat dichotomous branches. *Leaflets* 3–6 or 8 inches long, slightly hairy, mostly petiolulate. *Flowers* in

large umbellulate panicles; peduncles pubescent. *Involucels* of several short subulate leaflets. *Calyx* with 5 small acute teeth. *Petals* greenish white. *Styles* united below; *stigmas* diverging or recurved. *Berries* small, not torose, dark purple when mature.

Rich woodlands: Canada to Georgia; and in gardens, cultivated. *Fl.* July. *Fr.* September.

Obs. This plant is native in our rich woodlands; but has been long introduced into gardens, as a popular medicine. The root, and berries, infused in alcohol, made a favorite tincture, in times past, for those who indulged in the perilous habit of taking such stomachics.

2. *A. spino'sa*, L. Shrub or low tree; stem and petioles prickly; leaves bipinnately compound; umbels in a very large much-branched panicle.

PRICKLY ARALIA. Angelica Tree. Hercules' Club.

Stem unbranched, prickly below, 10–20 and even 60 feet high. *Leaves* crowded at the summit of the stem, 2–4 feet long; *leaflets* ovate, acuminate, serrate, somewhat glaucous below. *Flowers* white.

Pennsylvania, South and West. June–August.

Obs. This striking species is sometimes seen in cultivation; at the North it is a low tree, but in the Southern States it sometimes attains the height of 40 or even 60 feet, its unbranched stems bearing the crowded leaves at their summits, having a palm-like appearance. The bark, root, and berries, have been used in medicine; they are aromatic and stimulant like those of the preceding species. *

3. *A. nudicaulis*, L. Stem very short, scarcely rising above ground; bearing a single long-stalked leaf, and a shorter naked scape, with 2–7 umbels.

NAKED-STEM ARALIA. Sarsaparilla. False Sarsaparilla.

Root creeping, thickish and long, somewhat aromatic but mawkish. *Stem* scarcely more than the crown of the root. *Leaf* on an erect *petiole* 6–12 inches long, 3-parted at summit; each division 2–5 inches in length, and bearing 5 odd-pinnate subsessile leaflets. *Scape* 4–8 inches high, divided at summit into 2–7 smoothish *peduncles*, about 2 inches long, each bearing a naked, many-flowered, globose umbel, an inch or an inch and a half in diameter. *Berries* torulose, purplish black when mature.

Obs. The root of this is sometimes used as a substitute for the Sarsaparilla of the shops, (a species of *Smilax*.) I believe both the original and the substitute to be rather innocent medicines,—provided the disease be not serious!

‡ **2. GINSENG.** *Flowers* dioeciously polygamous; *styles* and *cells* of the (red or reddish) fruit 2–3; *stem* herbaceous, low, simple, bearing at its summit a whorl of 3 palmately 3–7 foliolate leaves (or perhaps rather a single sessile twice-compound leaf,) and a single umbel on a slender naked peduncle.

4. *A. quinquefolia*, Gray. Root fusiform, often branched; leaflets mostly in fives, obovate, acuminate, unequally serrate, petiolulate; peduncle of the umbel rather shorter than the common petioles; styles 2; fruit succulent, 2-celled, 2-seeded.

FIVE-LEAVED PANAX. Ginseng.

Root perennial, 3–6 inches long, and about half an inch in diameter, often forked downwards, whitish, transversely rugose. *Stem* 9–18 inches high, herbaceous, angular, smooth, with a verticil of 3 (rarely 4) petiolate compound leaves at summit, and a simple erect pedunculate umbel in the centre. *Common petiole* 3–4 inches long. *Leaflets* unequal,—the 3 principal ones 3–5 inches long, the lateral ones much smaller. *Umbel* many-flowered,—the central flowers often abortive. *Petals* yellowish green. *Ovary* compressed, cordate-ovate, or gibbous at base on each side. *Fruit* a fleshy drupaceous reniform berry, crowned with the persistent calyx-teeth and styles, smooth, bright crimson when mature.

Rich woodlands : Northern and Western States. *Fl.* July. *Fr.* September.

Obs. The root of this plant is slightly stimulant, and rather pleasantly aromatic. It has long been, and continues to be, an article of some importance in our commerce with China ; and although it has but little to do with Agriculture, it is presumed that a brief description of a native plant, so abundantly produced in our western forests—and so highly prized in the “ Celestial Empire ”—will not be unacceptable.

2. HE'DERA, L. IVY.

[Name supposed to be from the Celtic word for cord.]

Calyx of 5 teeth. *Petals* 5, broadest at base. *Stamens* 5–10. *Style* simple, or 5–10, more or less combined. *Berry* with 3–10 seeds, crowned by the calyx. Evergreen *shrub* adhering to objects by means of numerous rootlets.

1. H. HE'LIX, L. Leaves thick, angular-heart-shaped, 3–5-lobed, those of the flowering shoots ovate and pointed ; umbels erect.

English Ivy. Irish Ivy.

Stem long and tortuous, climbing walls, &c., to a great height, and adhering firmly. *Leaves* dark shining green, veined with white. *Flowers* in spherical heads or umbels, yellowish green. *Berries* obscurely 4-angled, about the size of peas, black.

Native of Europe. Cultivated.

Obs. This beautiful vine thrives well, when planted in a northern exposure, even at the south. The so-called Irish Ivy is a broader leaved form.

ORDER XXXV. CORNA'CEÆ. (CORNEL FAMILY.)

Chiefly *small trees* or *shrubs*, with mostly opposite entire *leaves* destitute of stipules, and *flowers* in cymes, sometimes clustered into heads and surrounded by a large petaloid *involucre*. *Calyx* adherent to the 2-celled ovary,—the *limb* 4-toothed. *Petals* 4, valvate in æstivation. *Stamens* as many as the petals, and alternate with them. *Styles* united into 1. *Fruit* a 2-celled drupe, crowned with the persistent calyx-teeth. *Seeds* solitary, pendulous : *embryo* nearly the length of the fleshy albumen.

1. COR'NUS, Tournef. Dogwood.

[Latin, *Cornu*, a horn ; from the horny toughness of the wood.]

Calyx 4-toothed,—the teeth minute. *Petals* oblong, spreading. *Stamens* longer than the corolla. *Style* sub-clavate ; *stigma* obtuse or capitate. *Drupe* oval or subglobose, with a 2–3-celled nut.

* *Flowers* capitate, with a 4-leaved involucre.



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1. *C. flo'rida*, L. Arborescent; leaves ovate-oblong, acuminate; involucre large,—the petaloid leaves obcordate or with a callous notch at apex; drupes oval.

FLOWERING CORNUS. Dogwood. Common Dogwood.

Stem 15–20 (sometimes 30–40) feet high, and 3–4 to 6–8 inches in diameter, much branched,—the young branches opposite or often verticillate in fours. *Leaves* 3–5 inches long, pilose with short appressed hairs, glaucous beneath. *Flowers* in terminal capitate clusters; *involucre* about 3 inches in diameter,—the leaves in opposite pairs, white or sometimes tinged with purple. *Corolla* greenish yellow. *Drupe* bright red when mature.

Woodlands: Canada to Louisiana. *Fl.* May. *Fr.* October.

Obs. The wood of this small tree is very close-grained and firm, and is valuable for many purposes in mechanics. Cabinet-makers sometimes employ it in the manufacture of small articles of furniture,—in which my friend Dr. Elwyn assures me it is very beautiful. The woodman selects it as the best material for wooden wedges. The young, straight stems make good hoops for the cooper; and the slender verti-

FIG. 112. Flowering Dogwood (*Cornus florida*), the head of minute flowers, surrounded by a conspicuous involucre. 113. A separate flower, enlarged.

cillate branches once furnished distaffs for *spinsters*,—in the “good old times” when that description of females had a practical existence in the community. The bark is an excellent tonic,—almost rivalling the Peruvian in efficacy. A century since, according to KALM, there was so much faith in the virtues of the Dogwood, that “when the cattle fall down in the spring, for want of strength, the people tie a branch of this tree on their neck, thinking it will help them!” Altogether, and without any joke—it is a valuable as well as ornamental little tree,—worthy of a place in lawns and yards. Observing farmers have remarked that the proper time to plant Indian corn is when the involucre of the Dogwood are first developed. There are several other species, with flowers in large flat cymes, common in thickets. They all possess more or less beauty, and will be found described in the systematic works.

2. NYS'SA, L. TUPELO.

[The name of a Water Nymph ; applied to this genus.]

Flowers diceciously polygamous, clustered. STAMINATE FLOWER with a small 5-parted calyx and 5–12, oftener 10 stamens inserted around a disk in the bottom of the calyx. PISTILLATE FLOWER with a calyx having a short repand truncate or minutely 5-toothed limb. Petals very small and fleshy, deciduous or often wanting. Stamens 5–10, with perfect or imperfect anthers. Style elongated, revolute, stigmatic down one side. Ovary 1-celled. Drupe ovoid or oblong, with a bony and grooved or striate 1-celled and 1-seeded stone. Trees with small greenish flowers, the staminate ones in a simple or compound dense cluster of fascicles, the pistillate ones much larger, and either solitary or in clusters of 2–8 ; appearing with the leaves.

1. N. MULTIFLO'RA, *Wang.* Leaves oval and obovate, acute at each end, often acuminate, entire ; fertile peduncles, mostly 3-flowered.

MANY-FLOWERED NYSSA. Sour Gum. Black Gum. Pepperidge. Tupelo.

Stem 30–60 or 70 feet high, and 1–2 feet in diameter ; branches numerous, horizontally spreading and often a little drooping. *Leaves* 2–4 inches long, dark green and shining above, paler and pubescent beneath ; *petioles* half an inch to an inch long, often margined, conspicuously villous-ciliate. *Staminate flowers* pedicellate, 2–5 or 6 in a loose cluster, on a slender common peduncle about an inch long. *Fertile flowers* sessile, mostly 3 in a dense involucre cluster (sometimes 2, or only 1), on a clavate common peduncle, which at first is about half an inch—finally an inch to an inch and a half—in length. *Drupe* elliptic, near half an inch long, bluish-black when mature.

Moist woodlands and low grounds : throughout the United States. *Fl.* May–June. *Fr.* September.

Obs. The woody fibres of this tree are remarkably interlocked, so as to render it very difficult to split ; on which account it is much used for making naves, or hubs, for carriage wheels,—and also hatters' blocks. The younger trees, when growing solitary, have much symmetry—affording a fine shade ; and in autumn the leaves add greatly to the picturesque appearance of the country, by changing to a bright crimson color.

DIVISION II.

MONOPET'ALOUS EX'OGENS.

FLORAL ENVELOPES, consisting of both calyx and corolla,—*the petals more or less united.*

ORDER XXXVI. CAPRIFOLIA'CEÆ. (HONEYSUCKLE FAMILY.)

Mostly *shrubs*, often twining, rarely *herbs*, with opposite *leaves* without stipules. *Calyx* adherent to the ovary. *Corolla* tubular or rotate, regular or irregular. *Stamens* as many as the lobes of the corolla, and alternate with them—or rarely 1 fewer—inserted into the tube. *Ovary* 2–5-celled; *style* long and filiform with a capitate stigma—or 3–5 sessile stigmas. *Fruit* baccate, or sometimes dry, often 1-celled by abortion. *Embryo* in the axis of fleshy albumen.

§ 1. Corolla tubular, often irregularly lobed, sometimes 2-lipped.

Style long and slender; stigma capitate.

Corolla tubular, mostly irregularly 5-lobed. Stamens as many as the lobes of the corolla. Berry several-seeded.

Corolla bell-shaped, regular. Berry 2-seeded.

Corolla tubular, gibbous at base. Fruit with 3–5 bony seeds.

1. LONICERA.

2. SYMPHORICARPUS.

3. TRIOSTEUM.

§ 2. Corolla wheel-shaped, regularly and deeply 5-lobed. Stigmas mostly 3, sessile. Inflorescence cymose or thyrsoïd.

Leaves pinnate. Berry 3-seeded.

4. SAMBUCUS.

Leaves simple. Fruit a drupe with 1 flat stone.

5. VIBURNUM.

1. LONICE'RA, L. HONEYSUCKLE.

[Dedicated to the memory of *Adam Lonicer*, an old German Botanist.]

Calyx-teeth very short. *Corolla* tubular or funnel-form, often gibbous at base, irregularly or nearly regularly 5-lobed. *Ovary* 2–3-celled. *Berry* several-seeded. Twining or upright *shrubs*; upper *leaves* often connate; *flowers* axillary.

1. *L. gra'ta*, Ait. Leaves sub-perennial, obovate, 2–3 upper pairs connate, the lower ones sub-petiolate; corolla not gibbous at base, tube long.

AGREEABLE LONICERA. Wild Honeysuckle. American Woodbine.

Stem 10–20 feet long, branching, the young branches often pilose. *Leaves* 1–3 inches long, rather obtuse and often slightly emarginate, glaucous and reticulately veined beneath. *Flowers* in verticils of about 6, in the axils of the upper connate leaves; *corolla* externally red or purplish, the limb at first nearly white, soon becoming tawny yellow,—the tube an inch or more in length, tapering to the base, smooth within. *Stamens* exserted, about equalling the *style*. *Berries* orange red at maturity, crowned with the persistent calyx teeth.

New York, Pennsylvania, and westward. Often cultivated. May.

Obs. This and other species of Honeysuckle are favorite plants for decorating arbors and porticoes. Most of them are delightfully fragrant when in flower, and are much frequented by the exquisitely beautiful little humming-bird.

Among those most commonly cultivated are the Italian Honeysuckle, (*L. CAPRIFO'LIUM*), with glaucous leaves, fragrant blush-colored flowers and yellow berries; the Woodbine (*L. PERICLY'MENUM*) with the leaves

all separate; the Trumpet Honeysuckle, (*L. SEMPER'VIRENS*), a native scentless species with a long tubular, red or yellow corolla with the margin divided into 5 short, nearly equal lobes.

2. SYMPHORICAR'PUS, *Dill.* SNOWBERRY.

[Greek, *Symphoreo*, to bear together, and *Karpos*, fruit; the berries growing in dense clusters.]

Calyx-teeth short, persistent on the fruit. *Corolla* bell-shaped regularly 5-lobed with as many stamens inserted into its throat. *Ovary* 4-celled. *Berry* 2-seeded. Low *shrubs* with short petioled leaves. *Flowers* in short close clusters. The upper flowers often developing after the lower ones of the cluster have matured their fruit.

1. *S. racemo'sus*, *Mx.* Spikes terminal, loose, interrupted, often somewhat leafy; corolla bearded within; berries white.

Snow-Berry.

Shrub 2-4 feet high, with numerous slender branches clothed with loose bark. *Leaves* 1-2 inches long, more or less broadly ovate, often undulate on the margin, those of the young shoots sometimes obtusely toothed; under surface softly pubescent, upper smoothish. *Flowers* about $\frac{1}{4}$ of an inch long, rose color. *Berries* brilliant white.

Rocky banks: North and West. June-September.

Obs. This is often seen in cultivation, its bright white berries, which remain on the bush until winter, making it a conspicuous object among the shrubbery. *

3. TRIOS'TEUM, *L.* FEVER-WORT.

[Greek, *Treis*, three, and *Osteon*, a bone; from its three bony seeds or nuts.

Calyx-tube ovoid; *segments* lance-linear, foliaceous, persistent. *Corolla* gibbous at base, nearly equally 5-lobed. *Berry* drupaceous, rather dry, 3-celled, with 3 bony 1-seeded *nuts*. Perennial hairy *herbs*; *leaves* subconnate, tapering at base; *flowers* axillary, sessile, bracteate.

1. *T. perfolia'tum*, *L.* Softly hairy; leaves spatulate-ovate, abruptly narrowed at base; axils 1-3-flowered; flowers dark, brownish-purple.

PERFOLIATE TRIOSTEUM. Fever-wort. Horse Gentian, &c.

Stem 2-4 feet high, simple, somewhat viscid while young. *Leaves* 4-6 inches long, and 2-4 inches wide, often narrowed almost to a petiole at base, but always connate, the margin ciliate pubescent. *Corolla* about half an inch long, viscid-pubescent. *Berry* oval, orange color when mature.

Rocky woods. June.

Obs. The root of this plant was formerly somewhat noted as an Indian medicine; but is now neglected. JOHN BARTRAM (in the Appendix to SHORT'S *Medicina Britannica*) says it is "called in our Northern Colonies Dr. Tinker's Weed; in Pennsylvania, Gentian; and to the southward, Fever Root."

4. SAMBU'CUS, *Tournef.* ELDER.

[Greek, *Sambuke*, a musical instrument ; said to have been made of this shrub.]

Calyx with the segments minute. *Corolla* urn-shaped, with a broadly spreading 5-cleft limb. *Fruit* sub-globose, baccate ; nucules 3, (rarely 5,) crustaceous, rugulose, each containing a suspended seed. *Shrubs* or perennial *herbs*. Leaves odd-pinnately dissected. *Inflorescence* cymose or thyrsoid.

1. *S. Canaden'sis*, *L.* Stem suffruticose ; leaflets oblong-oval, acuminate, serrate ; flowers in 5-parted spreading cymes.

CANADIAN SAMBUCUS. Elderbush. Common Elder.

Stem 5-8 or 10 feet high, finally shrubby, filled with a large pith, branching, nodose—the young branches tumid at the nodes. *Leaflets* usually in 3 pairs with a terminal odd one, 2-4 inches long, petiolulate. *Cymes* broad, terminating young branches, on peduncles 4-6 inches long. *Corolla* white. *Berries* numerous, small, juicy, dark purple or nearly black when mature.

Thickets and fence rows : throughout the United States. *Fl.* June. *Fr.* August.

Obs. This is a rather troublesome plant, on our farms,—the long roots being very tenacious of life, and inclined to spread extensively along fence-rows and hedges. If neglected, it soon gives the farm a very slovenly appearance.

This species is considered by some botanists as a mere variety of the European *S. nigra*, which it certainly closely resembles. Like that species, it is considerably employed in domestic medicine. An infusion of its flowers, Elderblow-tea, is a harmless and efficient diaphoretic, and the juice of the berries makes a tolerable wine. The bark is said to act as a purgative and emetic.

5. VIBUR'NUM, *L.* VIBURNUM.

[A classical Latin name ; etymology obscure.]

Calyx 5-toothed. *Corolla* spreading, deeply 5-lobed. *Fruit* a 1-celled 1-seeded *drupe*, with a scanty pulp and a crustaceous more or less flattened *nut*. *Shrubs* ; leaves simple, petiolate ; petioles sometimes bearing little appendage-like stipules. *Flowers* usually white, in flat compound mostly terminal *cymes*.

* *Flowers all alike and perfect.*

1. *V. Lenta'go*, *L.* Leaves lance-ovate, acuminate, sharply-serrate ; petioles with wavy margins ; cymes sessile, somewhat corymbose, terminal ; drupes oval, slightly compressed.

Sweet Viburnum. Sheep-berry.

A tree 15-20 feet high. *Petioles* $\frac{1}{2}$ an inch to an inch long, the undulate margin dotted with brown scales when young. *Leaves* 2-4 inches long. *Drupe*s often half an inch long, ripe in October, changing from a rich scarlet to a bluish black with a glaucous bloom—edible especially after having been frozen.

Canada to Georgia. May-June.

Obs. There are several other species belonging to this section ; this is the most elegant of them, and is really worthy of culture as an ornamental tree, it being beautiful, whether clothed with its rich green foliage and profusion of flowers in spring, or bearing its plentiful clusters of fruit and its many-hued leaves in autumn.

****** *Marginal flowers of the cymes sterile, and with corollas many times larger than the others, forming a kind of ray.*

2. V. O'pulus, L. Nearly smooth ; leaves strongly 3-lobed, broadly wedge-shaped or truncate at the base, the lobes toothed ; petioles bearing stalked glands at the base ; cymes peduncled ; fruit ovoid, red.

Cranberry-tree. Bush, or High-cranberry.

Shrub 3-10 feet high with spreading branches. *Leaves* 3-5 inches in diameter with 3 very large divergent lobes and large unequal obtuse teeth. *Cymes* 3-4 inches in diameter, the outer and imperfect florets, more or less numerous, raised on longer stalks, destitute of stamens and pistils, the *corolla* nearly an inch in diameter, of 5 unequal rounded lobes. *Drupe* $\frac{1}{2}$ an inch long, intensely acid.

Pennsylvania, northward. *Fl.* June. *Fr.* September.

Obs. This species is found in the swamps in the northernmost States, and extends to the Arctic circle. The acid fruit is sometimes used as a substitute for cranberries, whence its popular name. It is better known in its cultivated state as the Guelder Rose or "Snow-ball," which is a variety with all the flowers sterile and bearing large corollas. The Snow-ball is one of the most generally cultivated shrubs, and is beautifully described by the poet, Cowper, as throwing up its—

" Silver globes, light as the foamy surf,
That the wind severs from the broken wave."

ORDER XXXVII. RUBIA'CEÆ. (MADDER FAMILY.)

Herbs, shrubs or trees with opposite or verticillate, entire leaves, connected by interposed stipules, or whorled without apparent stipules. *Flowers* regular. *Calyx-tube* adherent to the ovary, or sometimes free,—the *limb* 3-5-cleft or toothed—occasionally obsolete. *Corolla* inserted on the summit of the calyx-tube,—the *lobes* as many as those of the calyx. *Stamens* as many as the lobes of the corolla, and alternate with them. *Ovary* mostly 2-celled ; *styles* mostly 2, more or less united ; *stigmas* mostly 2, distinct or concrete. *Fruit* various,—baccate, drupaceous, capsular, or separable into indehiscent carpels. *Seeds* solitary, few, or numerous in each cell : *embryo* in the axis, or at the extremity, of copious fleshy or horny albumen.

This Order—comprising various Tribes, and nearly 250 Genera—contains many plants of great value—though but few of them immediately concern the North American farmer. Among the most important may be mentioned the Coffee plant (*Coffea Arabica*, L., which may yet, possibly, be advantageously cultivated in Florida, and some other places on our southern borders)—the Peruvian Bark (from various species of *Cinchona*)—and the Ipecacuanha (*Cephaelis Ipecacuanha*, Rich.) The well-known beautiful and fragrant Cape Jessamine (*Gardenia florida*) is also referred to this large Natural Family.

1. MADDER SUB-ORDER. *Ovary entirely coherent with the calyx-tube.*
Leaves whorled.

1. RU'BIA, Tournef. MADDER.

[Latin, *Ruber*, red ; the color produced by its roots.]

Calyx-tube ovoid-globose,—the *limb* 4-toothed or obsolete. *Corolla* sub-

rotate, 4 – 5-parted. *Stamens* short. *Styles* 2, united at base. *Fruit* didymous, subglobose, baccate, smooth. *Herbaceous* or *suffruticose*. *Stems* 4-angled, diffusely branching.



1. *R. TINCTORUM*, *L.* Stem herbaceous, flaccid, aculeate on the angles; leaves mostly in apparent verticils of six, lanceolate, sub-petiolate; peduncles axillary, trichotomous; lobes of the corolla with a callous acumination, but not cuspidate.

DYERS' RUBIA. Madder. Dyers' Madder.

Fr. La Garance. *Germ.* Die Faerber-Roethe. *Span.* Rubia.

Root perennial, large, reddish brown. *Stems* procumbent, 3 – 4 feet long, much branched, pubescent at the joints; angles prominent, sometimes more than 4, aculeate with short retrorsely curved prickles. *Leaves* and *stipules* similar, 1 – 2 inches long—the midrib and margins retrorsely aculeate—*flower-bearing branches* axillary, opposite. *Corolla* brownish yellow, often 5-lobed.

Gardens and lots: cultivated. Native of the East. *Fl.* July. *Fr.* September.

FIG. 114. The Madder Plant (*Rubia tinctorum*) reduced.

Obs. The root of the madder abounds in coloring matter, and is perhaps, the most valuable of all dyeing materials. Combined with proper mordants it produces a great variety of colors and shades, varying from the most delicate pink to the darkest brown, and even black. The great supply is from Holland, though it is cultivated to some extent in this country, especially in Ohio and Tennessee. Several species of *Galium*, known as "Cleavers," "Goose-grass" or "Bedstraw," are botanically allied to madder—but they are not sufficiently important even as *weeds* to require notice.

2. LOGANIA SUB-ORDER. *Leaves opposite, with stipules between them. Ovary free from the calyx.*

2. SPIGE'LIA, L.

[Named for *Prof. Spigelius*, a Botanist of the seventeenth century.]

Calyx 5-parted, persistent; the lobes slender. *Corolla* tubular-funnel-form, 5-lobed at the summit, valvate in the bud. *Stamens* 5; anthers linear. *Style* slender, hairy above, jointed near the middle. *Pod* short, twin, laterally flattened, separating at maturity from the base into two carpels, which open loculicidally, few-seeded. *Herbs* with the opposite leaves united by means of the stipules, and the flowers spiked in one-sided cymes.

1. *S. Marilan'dica*, L. Stem upright, simple; leaves sessile, ovate-lanceolate, acute; spike 3–8-flowered; tube of the corolla four times the length of the calyx, the lobes lanceolate; anthers and style exserted.

MARYLAND SPIGELIA. Carolina or Indian Pink. Pink-root. Worm-grass.

Root consisting of a great number of fibres. *Stems* annual, numerous, somewhat 4-angled, purplish, 6–15 inches high. *Leaves* 2–3 inches long and about half as wide at base, pubescent on the margins and nerves. *Corolla* an inch and a half long, crimson outside, yellow within.

Pennsylvania to Wisconsin and southward. June–July.

Obs. A showy and beautiful plant, sometimes cultivated in the flower garden, but is introduced here on account of its commercial value. The root is extensively used as an anthelmintic or worm-destroying medicine, and large quantities are collected for market in the southern and western states. It should be collected in autumn, and carefully dried before packing. An infusion of the root, commonly known as "Worm Tea," is one of the most popular medicines of its class. *

ORDER XXXVIII. VALERIANA'CEÆ. (VALERIAN FAMILY.)

Herbs with opposite leaves without stipules. *Calyx-tube* coherent with the ovary; *corolla* tubular, mostly 5-lobed; *stamens* fewer than the corolla lobes (usually 2–3) inserted on the tube; *stigmas* 1–3; *fruit* dry, indehiscent, 1-celled or with 2 empty cells and the other 1-seeded; *seed* suspended, without albumen.

The Valerian of the shops is produced by a species of the genus *Valeriana*, and the roots of one of our native species are eaten by the Indians of the far west. The only plant of interest to the agriculturist is the one described on the two following pages.



1. FE'DIA, L. CORN-SALAD.

[Origin of the name obscure.]

Calyx-teeth 3–5 or obsolete. *Fruit* 3-celled,—two of the cells empty, the other one 1-seeded, cellular-gibbous on the back. *Leaves* spatulate-oblong; *flowers* in dense *cymes*.

1. *F. olito'ria*, Vahl. *Fruit* compressed, oblique,—the fertile cell with a corky mass at the back, the sterile ones often confluent; *flowers* pale blue.

POT-HERD FEDIA. Lamb's Lettuce. Corn Salad.

FIG. 115. The Carolina Pink (*Spigelia Marilandica*).

Annual. Stem 4-12 inches high, dichotomously branching. Leaves half an inch to 2 inches long, sessile, subdentate, somewhat ciliate on the margin. Fruit finally broader than long.

Meadow banks and fields. May.

Obs. This is found sparingly, as yet, in this country, but is a common weed in Europe. It is cultivated for a spring salad, and is brought to the New York markets in considerable quantities. In order to obtain it early in the season, it should be sowed in the preceding autumn.

*

ORDER XXXIX. DIPSA'CEÆ. (TEASEL FAMILY.)

Herbs with opposite sessile leaves and no stipules. *Flowers* aggregated, mostly in dense involucre heads. *Calyx-tube* wholly (or sometimes at summit only) adherent to the ovary,—the limb cup-shaped and entire, or toothed—or forming a bristly or plumose pappus. *Corolla* tubular, the limb 4-5-lobed, sometimes ringent or irregular. *Stamens* mostly 4, distinct. *Ovary* 1-celled, with a single suspended ovule; *style* filiform. *Fruit* membranaceous or akene-like, indehiscent, crowned with the limb of the calyx, 1-celled, 1-seeded. *Embryo* nearly the length of the fleshy albumen.

The genus which is the type of this small Order, is the only one entitled to notice in this work.

1. DIP'SACUS, Tournef. TEASEL.

[Greek, *Dipsao*, to thirst; the stem-leaves holding water at their junction.]

Involucre many-leaved, longer than the acuminate subfoliaceous chaff of the receptacle. *Involucel* 4-sided, 8-furrowed, closely investing the ovary and fruit. *Calyx-tube* adherent to the ovary,—the limb minute, cup-shaped or discoid, entire. *Corolla* with four erect lobes. Stout biennials. *Stems* angular and prickly. *Leaves* opposite and often connate at base. *Heads* large, oblong,—the *florets* commencing to expand in a ring about the middle of the head, and gradually extending the process towards base and apex!

1. *D. sylves'tris*, Mill. Leaves lanceolate-oblong, crenate-dentate and serrate, prickly on the midrib; involucre curved upwards, longer than the head; chaff at the receptacle straight and flexible.

WILD DIPSA'CEUS. Teasel. Wild Teasel.

Root biennial. *Stem* 3-5 or 6 feet high, branched. *Radical leaves* 8-12 inches long; *stem leaves* sessile, subconnate—those of the branches lanceolate and often nearly entire. Leaflets of the *involucre* lance-linear, pungent at apex, unequal in length. *Heads* of flowers ovoid-oblong; *corolla* pale purple. *Bracts* or chaff of the receptacle oblong-cuneate, keeled, abruptly tapering into a straight flexible awn-like acumination, longer than the flowers—those at the top of the head longest.

Borders of fields, roadsides, &c. Northern and Middle States: introduced. Native of Europe. *Fl.* July. *Fr.* September.

Obs. This coarse plant is completely naturalized in some localities,—and is not only worthless, but threatens to become something of a nuisance to the farms, if not attended to. A little timely care, however, would soon subdue it.

2. *D. Fullo'num*, Mill. Leaves obovate and oblong-lanceolate, smoothish, serrate,—the upper ones entire; involucre spreading or reflexed, shorter than the head; chaff of the receptacle recurved, rigid.

FULLERS' DIPSACUS. Fullers' Teasel.

Fr. Chardon à Foulon. *Germ.* Aechte Kartendistel. *Span.* Cardencha.

Root biennial. *Stem* 4-5 feet high, branched. *Radical leaves* obovate, narrowed to a petiole at base; *stem leaves* connate-perfoliate. Leaflets of the *involucre* lanceolate, mucronate, rigid. *Heads* of flowers cylindric or elliptical; *corolla* pale purple. *Bracts* or *chaff* of the receptacle cuneate-oblong, keeled, bristly-ciliate on the margin, terminating in a rigid subulate recurved acumination.

Lots: cultivated. Native of Europe. *Fl.* July. *Fr.* September.

Obs. This species is cultivated by some cloth manufacturers, for the sake of the heads,—the rigid recurved points of the chaffy bracts, on the mature heads, serving as a kind of card, to raise the nap on woollen cloth.

ORDER XL. COMPOSITÆ. (COMPOSITE FAMILY.)

Mostly *herbs*, with alternate or opposite, often lobed or dissected (never truly compound) *leaves* without *stipules*, and *flowers* in close *heads* upon a common *receptacle*, and embraced by leaflets or scales, which form a general *involucre*. *Calyx-tube* closely adherent to the ovary; its limb or border (called *pappus*) consisting of hairs, bristles, or scales; sometimes wanting. *Corolla* either *tubular* and 5- (rarely 3-4-) lobed, or strap-shaped (*ligulate*) and mostly 5-toothed. *Stamens* 5 (rarely 4), inserted on the corolla; *anthers* united forming a tube which surrounds the 2-cleft *style*. *Fruit* an *akene* containing a single erect *seed*, which is destitute of *albumen*.

This immense Order contains about one-tenth of the known species of flowering plants. The flowers are either polygamous, monœcious or diœcious. Aside from the terms noticed above, used in describing plants of this family, it may be well to mention that the strap-shaped corollas are termed *rays*, and those heads possessing them are termed *radiate*. The tubular flowers compose the *disk*; a head composed entirely of these is said to be *discoïd*. The flowers of either kind are termed *florets*. The leaves or bracts forming together the involucre are termed *scales*, whatever their texture. The scales which often grow upon the receptacle, among the flowers, are called *chaff* (*paleæ*), if the receptacle is without these it is naked.

In systematic works, the distinctions into tribes are made upon minute characters of the style, too difficult for those who have not had some experience in examining minute objects; in order to facilitate the determination of the genera, an artificial key, modified from that in Gray's Manual, is appended. In this the systematic arrangement is broken up, but the genera as described are placed in their proper order. The * and ** prefixed to *Erigeron* and *Senecio* refer to sections of those genera.

SUB-ORDER I. TUBULIFLORÆ.

Corolla of the perfect flowers tubular, regularly 5- (rarely 3-4-) lobed; strap-shaped (ligulate) only in the marginal or ray-flowers, which when present are either pistillate only or neutral (with neither stamens nor pistil).

§ 1. Heads without ray-flowers; corollas all tubular.

* Flowers of the head all alike and perfect.

† Pappus consisting of bristles.

Pappus double, the outer very short, the inner of longer bristles.

1. VERNONIA.

Pappus simple, the bristles all of the same sort.

Heads few or many-flowered.

Receptacle (when the flowers are pulled off) bristly hairy

Akenes smooth. Pappus of plumose bristles.

Leaves decurrent. Scales of involucre tipped with a spine. 25. CIRSIUM.

Akenes smooth. Pappus plumose. Leaves not decurrent.

Scales of involucre, thick and fleshy with a lanceolate appendage terminated by a spine.

24. CYNARA.

Akenes wrinkled. Pappus of short and rough bristles.

27. LAPPAS.

Receptacle deeply honeycomb-like.

26. ONOPORDON.

- Receptacle naked.**
 Pappus of slender but rather stiff bristles. Flowers whitish or purplish. Scales of involucre several. 2. EUPATORIUM.
 Pappus of very soft and weak naked bristles. Flowers yellow. *22. SENEIO.
- ** Flowers of two kinds in the same heads.**
 Marginal flowers neutral and sterile, commonly enlarged. 23. CENTAUREA.
 Marginal flowers pistillate and fertile.
 Receptacle naked or bearing no conspicuous chaff.
 Pappus of capillary bristles. Scales of the involucre imbricated, dry and scarious. 20. GNAPHALIUM.
 Pappus of capillary bristles. Involucre of but one row of scales.
 Heads very small. *5. ERIGERON.
 Heads large. Pappus copious, very white. 21. ERECHTHITES.
 Pappus obsolete or none.
 Akenes broad at the top. Pappus a short crown. 18. TANACETUM.
 Akenes narrow at the top. Pappus none. 19. ARTEMISIA.
- *** Flowers of two kinds in separate heads ; one pistillate, the other staminate.**
 Heads monœcious.
 Fertile involucre small, 1-flowered, pointed and often tubercled. 8. AMBROSIA.
 Fertile involucre an oblong prickly bur, 2-celled, 2-seeded. 9. XANTHIUM.
 § 2. Rays present ; i. e., the marginal flowers, or some of them, with strap-shaped (ligulate) corollas.
 * Pappus of capillary bristles. (Rays all pistillate.)
- Rays occupying several rows.**
 Heads solitary upon a scape. 3. TUSSILAGO.
 Heads more or less corymbed. **5. ERIGERON.
- Rays in one marginal row, and**
 White, purple or blue, never yellow. Pappus simple. 4. ASTER.
 Yellow, of the same color as the disk.
 Scales of the involucre in one row. Pappus soft and weak. **22. SENEIO.
 Scales of the involucre imbricated. Pappus simple.
 Heads small, racemed or clustered. 6. SOLIDAGO.
 Heads large, terminating the branches. 7. INULA.
- ** Pappus none, or a cup or crown, or 2-3 awns, teeth or chaffy scales corresponding with the angles or edges of the akene, often with intervening minute bristles or scales.**
 † Receptacle naked.
 Akenes terete or angled. Pappus none. Receptacle flattish. 17. LEUCANTHEMUM.
 †† Receptacle chaffy.
 Rays neutral (rarely pistillate but sterile) ; the disk flowers perfect.
 Receptacle strongly convex or columnar, and
 Chaffy only at the summit ; the chaff deciduous.
 Pappus none. 14. MARUTA.
 Chaffy throughout.
 Akenes 4-sided, flat at the top. Pappus none, or a minute crown. 10. RUDECKIA.
 Akenes flattened laterally. Pappus of 2 deciduous scales. 11. HELIANTHUS.
 Akenes flat, wing-margined, bearing 2 persistent awns. 12. ACTINOMERIS.
- Receptacle flat.**
 Akenes flat or 4-sided, with 2 or more downwardly barbed persistent awns. 13. BIDENS.
- Rays pistillate and fertile, as well as the disk flowers.**
 Akenes flattened and margined. Pappus none. 16. ACHILLEA.
 Akenes 4-angled or terete. Receptacle convex or conical. Leaves alternate, dissected. 15. ANTHEMIS.

SUB-ORDER 2. LIGULIFLORÆ.

- Corolla ligulate in all the flowers of the head, and all the flowers perfect. Herbs with milky juice and alternate leaves.
 Pappus of numerous small chaffy scales.
 Flowers blue. 28. CICHORIUM.

Pappus plumose.

Akenes spindle-shaped. Flowers yellow.

Akenes long-beaked. Flowers purple.

Pappus not plumose, of bright white capillary bristles.

Akenes terete, long-beaked. Flowers solitary on scapes.

Akenes flat, long-beaked. Flowers in paniced heads.

Akenes flattened, not beaked. Pappus very soft.

29. LEONTODON.

30. TRAGOPOGON.

31. TARAXACUM.

32. LACTUCA.

33. SONCHUS.

1. VERNONIA, Schreb. IRON-WEED.

[Named in honor of *William Vernon*, an English Botanist.]

Heads many-flowered, in corymbose cymes. *Involucre* imbricate, shorter than the flowers,—the inner scales longest. *Receptacle* naked. *Akenes* clavate, ribbed. *Pappus* double,—the inner series of numerous bristles—the outer mostly short, minute, often dilated and scale-like. Mostly perennial *herbs*, with alternate leaves; *flowers* bright purple.

1. V. Noveboracen'sis, Willd. Leaves lanceolate or oblong, serrulate, roughish; heads numerous, in a terminal corymb; scales of the involucre ovate, acute or often with a long filiform flexuous point.

NEW-YORK VERNONIA. Iron-weed.

Stem 2 or 3–6 or 7 feet high, somewhat branching at summit, finally firm and subligneous. *Leaves* 3–6 or 8 inches long, subsessile, thickish or subcoriaceous. *Akenes* scabrous with short hairs; *pappus* a dirty white, or often purplish, scabrous—the outer series consisting of short chaffy or scale-like bristles.

Moist meadows and low grounds: throughout the United States. *Fl.* August. *Fr.* September.

Obs. This plant is quite common in moist low grounds, and along fence-rows. Its worthless character and coarse hard stem cause it to be regarded as a rather obnoxious weed, in our meadows; and of course it is carefully eradicated by all neat farmers.

2. EUPATO'RIMUM, Tournef. THOROUGH-WORT.

[Named from *Eupator Mithridates*; who, it is said, first used the plant.]

Heads 3–many-flowered. *Involucre* oblong, cylindric or campanulate,—the scales imbricated in 2, 3, or more series—or sometimes nearly equal in a single series. *Receptacle* flat, naked. *Akenes* 5-angled. *Pappus* a single series of very slender bristles, rough or minutely serrulate. Perennial *herbs*, with leaves mostly opposite or verticillate, often resinous dotted; flowers white or purplish.

1. E. perfolia'tum, L. Stem rigid, hirsutely villous, corymbosely branched above; leaves opposite and decussate, connate-perfoliate, oblong-lanceolate, crenate-serrate, reticulately veined and rugose, very pubescent beneath; heads about 10 or more flowered.

PERFOLIATE EUPATORIUM. Thorough-stem. Boneset. Indian Sage.

Stem 2–4 feet high, the branches whitish and very pubescent. *Leaves* 4–6 or 8 inches long, opposite and completely united at base—or sometimes contracted at base and scarcely connate (rarely verticillate in threes, and connate), tapering gradually to a slender point, sprinkled with resinous particles beneath. *Heads* of flowers crowded, in

large corymbs. *Scales* of the involucre lance-linear, rather acute. *Florets* white. *Akenes* smoothish.

Low swampy grounds : throughout the United States. *Fl.* July – August. *Fr.* Sept.

Obs. This species is so common in wet meadows, and low grounds, as to be regarded rather as an objectionable weed. But it is chiefly entitled to notice for its medicinal properties,—being either emetic, cathartic, or tonic—according to the dose, or mode of exhibition.

There are several other species of this genus, which meet the eye of the farmer in his meadows and along the borders of woods and thickets—particularly a tall, stout one, with verticillate leaves and purple flowers, (*E. purpureum*, L.) ; but they are scarcely of sufficient importance to claim a place in this work.

3. TUSSILA'GO, *Tournef.* COLTS-FOOT.

[Name from the Latin, *Tussis*, a cough ; for the cure of which the plant is used.]

Heads many-flowered, those of the *ray* narrowly ligulate, pistillate, fertile, in several series, the *disk-flowers* few, staminate. *Scales of the involucre* oblong obtuse, in nearly a single series. *Receptacle* flat. *Fertile achenia* cylindrical oblong. *Pappus* capillary, copious in the fertile flowers. A perennial herb with thick creeping root-stocks ; leaves radical, appearing later than the *scaly scapes* ; flowers yellow.

1. *T. Far'fara*, L. Scapes single-flowered, imbricated with scales, woolly when young ; leaves long petioled, cordate, angular-toothed.

Colts-foot.

Root-stock widely spreading. *Scapes* about a foot high. *Leaves* which acquire their full size after the lowering season, 3–5 inches in diameter, the margin irregularly lobed and angular, smoothish above and white tomentose below. *Heads* of flowers about $\frac{3}{4}$ of an inch in diameter.

Along streams : New England and New York. Introduced from Europe. March – April.

Obs. The Colts-foot which is sometimes a troublesome weed in the cultivated grounds of England, is perfectly established in the cooler portions of our country. It is not introduced here on account of any importance it possesses with us as a weed, but for its popular, medicinal reputation. It is one of those harmless plants which have long been considered as efficacious domestic remedies, and it is even cultivated in old gardens. An infusion of the whole plant is used for coughs and pulmonary complaints. It is probably about as valuable as any other mucilaginous drink, with some tonic qualities. The leaves have sometimes been smoked for asthma. *

4. AS'TER, *Tournef.* ASTER.

[Greek, *Aster*, a star ; the radiated heads of flowers resembling stars.]

Heads many-flowered—the ray-florets in a single series, pistillate,—those of the disk tubular and perfect. *Scales* of the involucre more or less imbricated, usually whitish below and green or foliaceous at apex. *Recep-*

table flat, mostly alveolate, (or pitted.) *Akenes* usually compressed. *Pappus* simple, of capillary bristles. *Heads* corymbose, paniculate, or racemose ; *rays* purple, white, or blue.

1. *A. ericoi'des*, L. Smoothish, much branched,—the simple leafy branchlets or peduncles racemose and mostly unilateral on the virgate spreading branches ; leaves rather rigid,—the radical and lower cauline ones oblanceolate or oblong-spatulate, tapering to a margined petiole,—the others linear-lanceolate and linear-subulate, acute at each end ; heads small, numerous, solitary on the branchlets ; involucre hemispherical or subturbinate,—the scales loosely imbricated, linear-oblong, acute, spreading at apex.

ERICA, OR HEATH-LIKE ASTER.

Stem 1–2 or 3 feet high, often branched from the base. *Radical leaves* 1–3 or 4 inches long, sparingly serrate, ciliate, tapering to a petiole nearly as long as the leaf ; *stem-leaves* 1–3 inches long, those on the branchlets smaller, subulate-linear. *Rays* white, or often tinged with pale purple,—the *disk* often becoming reddish purple.

Sterile soils ; old fields, pastures, &c. : throughout the United States. *Fl.* August–September. *Fr.* October.

Obs. Many species of this genus meet the eye of the farmer, in the latter part of summer, in his woodlands, low grounds, borders of thickets, &c., some of which species are quite ornamental ; but the little bushy one here described (which, I believe, has not acquired a *common name*,) is almost the only one which invades our pastures to any material extent. In thinnish old fields, it sometimes becomes an abundant—as it is always a very worthless—weed. Good culture, and enriching the soil, soon cause it to disappear.

The commonly-cultivated China Aster is placed by most botanists in an allied genus, *Callistephus* ; in the most prized varieties of which, known as “German Asters,” the rays are not developed, but the disk flowers are very large. There are over 30 species of native Aster in the Northern States, and many more at the South ; some of these are quite showy in cultivation.

5. ERIG'ERON, L. FLEA-BANE.

[Greek, *Er*, spring, and *Geron*, an old man ; the plant being hoary in spring.]

Heads many-flowered, somewhat hemispherical ; *ray-florets* very numerous and usually in more than one series, pistillate,—those of the disk tubular, perfect. *Scales* of the involucre mostly equal, narrow, in a nearly single series. *Receptacle* flat, naked, punctate. *Akenes* compressed, usually pubescent. *Pappus* a single series of capillary scabrous bristles, often with minute ones intermixed,—or sometimes with an exterior coroniform pappus of subulate scales. *Heads* corymbose or paniculate.

* *Pappus* single ; *rays* inconspicuous, white.



1. *E. Canadense*, L. Stem hirsute, paniculately branched; leaves lance-linear, mostly entire, hispidly ciliate; heads of flowers small, numerous, racemose on the branches; rays minute.

CANADIAN ERIGERON. Horse-weed. Butter-weed.

Root annual. *Stem* 6 inches to 5 or 6 feet high. *Leaves* 1-3 or 4 inches long, sessile,—the lower ones sparingly dentate. *Rays* white, very narrow, scarcely longer than the straw-colored pappus. *Akenes* oblong, sparsely hispid.

Fields, road-sides, and waste places: throughout the United States. *Fl.* August-Sept. *Fr.* September-October.

FIG. 116. Portion of the upper part of the stem of Canada Fleabane (*Erigeron Canadense*). 117. A separate floret.

Obs. This plant varies very much in size, according to the soil in which it grows. On dry sterile banks it is very dwarf. It has disseminated itself, more or less abundantly, all over our country,—and, it is said, all over Europe; and is a worthless weed, wherever found. Good farming is the mode for smothering out such intruders.

**** Pappus double, the outer row of minute scales; rays conspicuous, white.**

2. E. an'nuum, Pers. Stem sparsely hirsute, corymbosely branched above; leaves coarsely and sharply dentate-serrate,—the radical and lower ones ovate, obtuse, tapering into a margined petiole,—the others sessile, lanceolate, acute, entire near each end; rays very narrow, about as long as the sparsely setose involucre.

ANNUAL ERIGERON. Flea-bane. Daisy.

Root biennial? (annual, DC.). *Stem* 2–3 or 4 feet high, rather stout, striate and often angular. *Radical leaves* 2–4 inches long, roughish and hairy, with narrow-margined petioles nearly twice as long as the leaves; *stem-leaves* gradually smaller as they ascend. *Heads* of florets rather small; *rays* white, or sometimes tinged with purple. *Akenes* oblong, somewhat compressed, hirsute; *pappus* whitish,—the ray-florets destitute of pappus, except a few short coroniform teeth at or near the summit of the akene.

Pastures and waste places: Northern, Middle and Western States. *Fl.* June–July. *Fr.* August

Obs. A frequent worthless weed in our pastures; not particularly injurious,—but conspicuous enough to attract the notice of the observing farmer; and therefore worthy to be known by him.

3. E. strigo'sum, Muhl. Stem more or less strigosely hairy, corymbosely paniculate above; leaves lanceolate, narrowed at base, nearly entire,—the radical ones spatulate-lanceolate, tapering into a margined petiole; rays narrow, nearly twice as long as the minutely hispid involucre.

STRIGOSE ERIGERON. Flea-bane. Daisy.

Root biennial? *Stem* 2–4 feet high, sulcate-striate and angular, rather slender, and often sparingly branched. *Leaves* 1–3 inches long. *Heads* of florets rather larger than in the preceding; *rays* white. *Akenes* oblong, angular or ribbed, sparsely pilose: “*inner pappus* in the disk, of about 15 slender fragile and deciduous bristles; in the ray none, or sometimes of one or two caducous bristles: the *exterior* a small setaceous-squamellate crown, similar in the ray and disk.” *Torr. & Gr.*

Pastures and upland meadows: Canada to Florida. *Fl.* June–August. *Fr.* July–September

Obs. This plant has a strong general resemblance to the preceding, but is more common,—though they are usually both confounded under the same popular names. This one is apt to be very abundant in the first crop of our upland meadows, in Pennsylvania, after a course of grain crops. After that—especially in good land—it becomes more rare,—being probably choked down by the grasses. All three of the species are equally worthless, unwelcome weeds.

6. SOLIDA'GO, L. GOLDEN-ROD.

[Latin, *Solido*, to unite, or make firm ; from its supposed healing virtues.]

Heads few- or sometimes many-flowered ; *ray-florets* few, pistillate ; *disk-florets* tubular, perfect. *Scales* of the oblong *involucre* imbricated, appressed, not green or foliaceous at apex. *Receptacle* small, mostly naked. *Akenes* many-ribbed, somewhat terete. *Pappus* simple, consisting of numerous scabrous capillary bristles, mostly equal. *Heads* in terminal or axillary racemes, with the pedicels often unilateral, —sometimes corymbose. *Perennials*, with wand-like stems and nearly sessile stem leaves, never heart-shaped.

1. *S. nemora'lis*, Ait. Stem simple or corymbosely branched above, clothed with a very short velvety cinereous pubescence ; radical leaves obovate-cuneate or spatulate, tapering into a petiole, sparingly crenate-serrate,—cauline ones oblanceolate, nearly entire, roughish-pubescent ; racemes numerous, short, dense, unilateral, at length recurved-spreading, often corymbose-paniculate ; scales of the involucre lance-oblong, obtuse, appressed ; akenes pubescent with white appressed hairs.

WOOD OR GROVE SOLIDAGO. Golden-rod.

Whole plant of an ash-colored or greyish aspect, by reason of its short cinereous pubescence. *Stem* 1–2 or 3 feet high, sometimes branched from near the root. *Radical leaves* 1–4 or 5 inches long, with *petioles* 1–3 inches long. *Heads* with 3–6 disk-florets, and 6–9 ray-florets, in secund racemes—or (in stunted branched specimens) often in small axillary clusters ; *rays* rather short, spatulate-oblong.

Sterile, neglected old fields ; borders of woods, &c. : throughout the United States. *Fl.* August–September. *Fr.* October.

Obs. Several species of *Solidago* (or Golden-rod, as they are all named, in the vernacular tongue)—some of them much larger than this—occur along fence-rows, borders of woods and thickets, &c. They are all no better than *weeds* on a farm : but this is the one which mostly intrudes upon neglected pasture grounds,—and has therefore been selected for description, as a sample of the genus. It is speedily banished by good farming,—as most of our native weeds are, or may be. *S. odo'ra*, Ait. The “Sweet Golden-rod” is found in dry soil—it is distinguished by the smoothish, entire, linear-lanceolate leaves which contain numerous pellucid dots of oil, with a pleasant odor. An infusion of the herb is used as an aromatic stimulant. The oil is sometimes distilled from the plant, and is used for the same purpose.

7. IN'ULA, L. ELECAMPANE.

[The ancient Latin name.]

Heads large, many-flowered ; *rays* in a single series, very numerous, linear. *Involucral scales* loosely imbricated, in several series, the outer foliaceous. *Akenes* 4-sided or terete ; *pappus* of capillary bristles. *Perennial* ; leaves often clasping ; *heads* solitary or corymbose ; *flowers* yellow.

1. *I. Hele'num*, L. Stout; pubescent; leaves large, oblong ovate, those of the stem clasping; akenes 4-sided.

Elecampane.

Stem 3–5 feet high, sulcate, branching above. *Leaves* 9–18 inches long, and 4–8 inches wide, acute or acuminate, denticulate, hoary-tomentose beneath,—the *radical* ones *petiolate*. *Outer scales* of the *involucre* ovate, tomentose. *Anthers* produced at the base into two tails, or bristle-like appendages. *Akenes* smooth; *pappus* pale tawny.

Roadsides, &c. Naturalized from Europe. July–August.

Obs. Common along road-sides, and having a very slovenly aspect after the flowering season is past. The large thick root has a camphor-like smell and a warm, bitter taste; it was formerly in high repute as a medicine, but is now seldom used; it is a tonic and expectorant,—as those medicines are called which affect the secretions of the throat. *

8. AMBRO'SIA, Tournef. RAG-WEED.

[Poetically, *Food of the Gods*; in this case something like *Lucus*, *a non lucendo*.]

Sterile and fertile *flowers* in different heads on the same plant; the *staminate* in terminal racemes or spikes,—the *pistillate* ones at their base or in the axils of the upper leaves. **STAMINATE FL.** *Involucre* flattish, hemispherical, or subturbinate, composed of several united scales, 5–20-flowered. *Corolla* funnel-form, 5-toothed. *Receptacle* flattish, usually with filiform chaff among the florets. **PISTILLATE FL.** *Inv lucre* globose-ovoid or turbinate, closed, acuminate, usually with 4–8 pointed tubercles near the summit, 1-flowered. *Corolla* none. *Akene* subglobose or obovoid. Annual *herbs*. *Leaves* lobed, or pinnatifidly dissected.

1. *A. trifi'da*, L. Stem tall and stout, hairy and rough; leaves mostly opposite, palmately 3–5-lobed, hairy, scabrous,—the lobes oval lanceolate, acuminate; petioles narrowly winged, ciliate; racemes elongated, paniculate.

TRIFID AMBROSIA. Great Rag-weed.

Stem 3–6 or 8 feet high, branched. *Leaves* 4–6 or 8 inches long; *petioles* 1–2 inches long. *Staminate heads* small, numerous, in long terminal paniculate racemes; *florets* whitish. *Pistillate heads* at the base of the racemes; the *involucre* turbinate-obovoid, with a conical apex, 6-ribbed, the ribs terminating in so many pointed tubercles round the base of the conical acumination.

Low grounds and waste places: Canada to Georgia. *Fl.* August. *Fr.* October.

Obs. This coarse ugly *weed* is sufficiently common, and worthless, to entitle it to the notice of every farmer who desires to keep his premises clear of such nuisances.

2. *A. artemisiæfo'lia*, L. Stem paniculately branched, villous; leaves bipinnatifid, smoothish above, somewhat canescent beneath,—the uppermost simply pinnatifid; petioles ciliate with long hairs; racemes somewhat spicate, paniculate.

ARTEMISIA-LEAVED AMBROSIA. Bitter-weed. Rag-weed.



Stem 1-3 or 4 feet high, usually much branched or bushy. *Leaves* 2-4 or 5 inches long; *petioles* half an inch to an inch and a half long. *Staminate heads* small, numerous, in terminal slender spicate racemes. *Pistillate heads* solitary or clustered along the lower part of the staminate racemes and bracteate, or in the axils of the upper leaves; sometimes the heads are *dioecious*—specimens occurring in which the *terminal racemes* (or rather spikes), as well as the clusters beneath, are *all pistillate*, and the flowers in small sessile bracteate clusters.

Cultivated fields and pastures: Canada to Florida. *Fl.* August-September. *Fr.* October.

FIG 118. The Great Ragweed (*Ambrosia trifida*), upper portion of stem reduced in size

Obs. This worthless weed occurs in most cultivated grounds,—and is usually very abundant among the stubble, after a crop of wheat: but, if the land be good, the plant seems to be smothered or choked out, the next season, by the crop of clover and timothy. It is always ready, however—like several other coarse weeds—to make its appearance whenever the grassy turf is broken up. The curious anomaly above mentioned,—of the flowers on the terminal spikes being all pistillate,—is frequently met with.

9. XAN'THIUM, *Tournef.* CLOT-BUR.

[Greek, *Xanthos*, yellow; a color said to be produced by the plant.]

Heads monœcious, in spicate clusters—the sterile spikes at the summit.



FIG. 119. Flowering summit of the Cockle-bur (*Xanthium strumarium*), with heads of staminate flowers above, the pistillate ones below. 120. A separate staminate flower very much enlarged. 121. A head of (2) pistillate flowers enclosed in the prickly involucre.

STAMINATE FL. numerous in subglobose heads; scales of the involucre distinct, in a single series. Corolla tubular, clavate, somewhat hairy. Anthers connivent but distinct. Style abortive, undivided. Receptacle oblong, terete, chaffy. PISTILLATE FL. 2, inclosed in a 2-celled oblong coriaceous closed involucre, which is armed with hooked prickles and terminated by 1 – 2 stout beaks. Corolla filiform. Akenes solitary in each cell of the involucre, oblong, flat. Annual herbs. Leaves alternate, lobed or dentate.

1. *X. struma'rium*, L. Leaves broad-ovate, mostly somewhat 3-lobed dentate, unarmed at base; involucre of the fruit oval, with 2 straight beaks.

SCROPHULOUS XANTHIUM.
Clot-bur. Cockle-bur.

Fr. Lampourde. Germ. Die Spitzklette. Span. Lampazo pequeño.

Stem 1–3 feet high, roughish-pubescent, branching. Leaves 3–6 inches in length, and nearly as wide as long, subcordate at base, but cuneately produced at the union of the 3 principal nerves. Heads of flowers in axillary clusters. Involucre of the fruit persistent, becoming an oblong bur, with rigid uncinate prickles.

Road-sides and waste places: Northern and Middle States: introduced? Fl. August–September. Fr. October

Obs. This has the appearance of a naturalized stranger, but is considered by Gray as indigenous; it is an obnoxious weed,—though not much inclined to spread; and with a little attention, is easily kept in subjection. The burs are a great annoyance in the fleeces of sheep. The var. *echina'tum*, has the fruit more prickly with the beak incurved.

2. *X. spino'sum*, L. Leaves ovate-lanceolate, entire or somewhat



FIG. 122. Branch of the Thorny Clot-bur (*Xanthium spinosum*), showing the hooked prickly, mature involucres.

3-lobed, armed at base with slender 3-parted spines; involucre of the fruit cylindric-oblong, with an inconspicuous beak.

SPINOSE XANTHIUM. Thorny Clot-bur.

Stem 2-3 or 4 feet high, branched. *Leaves* 1-3 inches long, and one-fourth to three-fourths of an inch wide, entire or with a lobe-like tooth on each side,—the upper surface pale green, pubescent on the midrib—the under surface clothed with a short cinereous tomentum,—the base narrowed to a short *petiole*—on each side of which is a triple or 3-forked *spine*, the branches about an inch long, very sharp, yellowish or pale straw color. *Heads* of flowers axillary, solitary.

Farm-yards, road-sides, &c. : Massachusetts to Georgia : introduced. Native of Europe. *Fl.* September. *Fr.* October.

Obs. This execrable weed, believed to have originated in tropical America, and now widely diffused through various parts of the old world, is becoming naturalized in many portions of our country,—particularly in the Southern States. It may be frequently seen along the side-walks, and waste places, in the suburbs of our northern sea-port towns,—and is a vile nuisance wherever found. I have understood that the authorities of one of our cities, a few years since, enacted an Ordinance against the plant,—in which enactment it was denounced by the name of the Canada Thistle! The misnomer probably did not impair the efficacy of the Ordinance : yet I cannot help thinking it would be decidedly preferable that both lawgivers and farmers should avoid confounding objects which are essentially distinct,—and learn to designate even weeds by their proper names.

10. RUDBEC'KIA, L. CONE-FLOWER.

[In honor of *Olaus Rudbeck*, father and son ; Sweedish botanists.]

Heads many-flowered ; *ray-florets* neutral. *Involucral scales* in about 2 series, leaf-like, spreading. *Receptacle* more or less columnar ; *chaff* short, conical, not rigid. *Akenes* 4-angled, smooth ; *pappus* a minute crown-like border. Chiefly *perennials* ; *leaves* alternate ; rays yellow, generally long and drooping.

1. R. hir'ta, L. Hirsute ; lower leaves spatulate, petiolate, upper ones ovate-lanceolate, sessile ; disk conical, dark purple.

ROUGH-HAIRED RUDBECKIA.

Perennial? *Stem* 1½-4 feet high, rather stout, often simple or branched near the base. *Leaves* 2-3 inches long,—the radical ones on hirsute petioles 1-2 inches in length. *Heads* of flowers middle-sized, on long stoutish striate sulcate naked peduncles ; *chaff* of the receptacle sublinear, rather acute, hairy and ciliate at the summit.

Fields and in dry soil. July-September.

Obs. This is of late becoming rather common in cultivated lands, and cannot fail to attract the notice of the farmer. Another species which nearly resembles it, **R. ful'gida, Ait.**, is also found in similar situations ; the latter has 3-nerved leaves, and smooth chaff to the receptacle. But little is known of their character as weeds, but they have apparently an encroaching disposition, and should be eradicated. *

11. HELIAN'THUS, L. SUNFLOWER.

[Greek, *Helios*, the sun, and *Anthos*, a flower ; from the resemblance of the flowers.]

Heads many-flowered ; ray-florets numerous, neutral. *Involucre* imbricated in 3 or more series,—the *scales* often foliaceous and spreading at apex. *Receptacle* flattish or convex, and large,—the persistent chaff embracing the akenes. *Akenes* laterally compressed or sometimes rather 4-sided, not winged or margined. *Pappus* of 2 chaffy or awn-like scales, arising from the principal angles of the akenes, and often with 2 or more intermediate smaller scales, very deciduous. *Herbs*, annual or perennial, mostly stout and rough. *Leaves* opposite or alternate. *Heads* somewhat corymbose or solitary ; rays bright yellow ; disk-florets yellowish, or sometimes purplish at summit.

1. *H. TUBERO'SUS*, L. Root bearing oblong tubers ; stem erect, branching, scabrous ; leaves ovate, acuminate, serrate, 3-nerved, scabrous, petiolate,—the lower ones subcordate at base ; petioles ciliate ; scales of the involucre lanceolate, hispid and ciliate.

TUBEROUS HELIANTHUS. Jerusalem Artichoke.

Fr. Topinambour. *Germ.* Die Erdartichoke. *Span.* Cotúfa.

Root perennial ? (or rather *appearing* perennial, by the annual production of *tuberous rhizomas* ?) *Stem* 4–6 or 8 feet high, stout, branching, terete, hirsute. *Leaves* 4–6 or 8 inches long, very scabrous on the upper surface, abruptly contracted at base to a narrow cuneately-tapering margined *petiole*, which is 1–2 or 3 inches long,—the lower leaves opposite (or rarely ternate), the upper ones alternate. *Heads* rather large. *Akenes* somewhat compressed and 4-sided, cuneate-oblong, smooth ; *pappus* 1–4 (usually 2) subulate chaffy scales.

Gardens and lots : cultivated. Native of Brazil. *Fl.* August–Sept. *Fr.* October.

Obs. This Sunflower is often cultivated for the firm fleshy tubers, or rhizomas, found at its roots. These tubers are pickled, and used as a condiment. They have been commended, also, for feeding stock. It may be remarked here, that in a rich mellow soil, they multiply so rapidly, as to make the plant rather troublesome and difficult to keep within bounds. The common name “Jerusalem Artichoke,” is said to be a corruption of the Italian name for the plant—*Girasol*.

2. *H. AN'NUUS*, L. Root fibrous, annual ; stem stout, nearly simple ; leaves cordate and broadly ovate, petiolate ; heads subsolitary, very large.

ANNUAL HELIANTHUS. Sunflower.

Stem 4–8 feet high. *Leaves* 6–12 inches long and 4–8 inches wide, on petioles 3–6 inches in length. *Heads* of flowers 4–15 inches in diameter, flat, often nodding ; rays 1–2 inches long. *Akenes* obovate oblong, striate, somewhat pubescent, leaden-brown with white margins and stripes.

Gardens. Native of Peru. August–October.

Obs. This species is often cultivated, and is somewhat naturalized in gardens. A kind with the disk-flowers all developed as rays is common. The akenes contain considerable oil, and it has been recommended to cultivate the plant for the sake of this product ; the leaves and stems con-

tain a large amount of potash, and it would probably be found a very exhausting crop. Fowls are very fond of the fruit, or seeds, as they are usually called. *

12. ACTINO'MERIS, Nutt. ACTINOMERIS.

[Greek, *aktin*, a ray, and *meris*, a part ; the rays being sometimes few or irregular.]



Heads many-flowered ; *rays* few or several, neutral. *Scales* of involucre in 1 – 3 rows. *Receptacle* convex or conical chaffy. *Akenes* laterally compressed and winged. *Pappus* of 2 smooth persistent awns. Tall and branching *perennial* herbs with serrate feather-veined *leaves* tapering to the base, and mostly decurrent on the stem.

1. *A. SQUARRO'SA*, Nutt. Stem somewhat hairy and winged above ; scales of the involucre in 2 rows, the outer linear-spatulate, reflexed ; rays 4 – 10, irregular.

SQUARROSE ACTINOMERIS.

Stem 4 – 8 feet high, smooth below. *Leaves* a foot or more in length. *Akenes* broadly winged ; *receptacle* globular,

Western and Southern States, September.

Obs. This is said by Dr. Short to be a common weed in cultivated grounds in Kentucky. *

FIG. 123. Flowers of *Actinomeris squarrosa*. 124. A separate floret, the akenes with a 2-awned pappus.

13. *BIDENS*, L. BUR-MARIGOLD.

[Latin, *Bi-dens*, having 2 teeth ; in allusion to the awns of the akenes.]

Heads many-flowered ; *ray-florets* neutral, often inconspicuous and sometimes wanting,—those of the *disk* tubular and perfect. *Involucre* double,—the outer scales larger and often foliaceous. *Receptacle* flat-tish,—the *chaff* deciduous with the fruit. *Akenes* flattened, or slender and more or less 4-sided, crowned with two or more retrorsely hispid awns. Annual or sometimes perennial *herbs*. *Leaves* opposite, incised-serrate or pinnatifidly dissected. *Flowers* mostly yellow.

* *Akenes* flat and broadish, not beaked at summit, ciliate on the margins.

1. *B. frondo'sa*, L. Leaves odd-pinnately divided,—the lower ones with 5 divisions, the upper with 3 ; divisions distinct and mostly petiolulate, lanceolate, serrate ; heads discoid, on slender axillary peduncles ; outer scales of the involucre foliaceous, narrowed and ciliate at base, much longer than the head ; akenes obovate-cuneate, 2-awned, pubescent and ciliate with erect hairs.

FRONDOSE *BIDENS*. Bur-marigold.

Root annual. *Stem* 2–4 or 5 feet high, somewhat hairy, often dark purple, branched. *Leaflets* or segments 2–4 or 5 inches long, pilose beneath, abruptly narrowed at base to a short margined ciliate *petiolule*,—the common *petiole* 1–3 inches long. *Heads* rather small, on long slender naked peduncles. *Involucre* double,—the 8–10 outer scales lanceolate, leaf-like, unequal, 2 or 3–5 or 6 times as long as the head, ovate-lanceolate, with a scarious margin. *Florets* yellowish. *Chaff* of the receptacle linear-lanceolate, about as long as the akenes.

Gardens, fence-rows, Indian-corn fields, &c. : throughout the United States. *Fl.* August–September. *Fr.* October.

Obs. All the species, here enumerated, are very worthless, and particularly disagreeable weeds,—on account of the barbed awns of the fruit, which cause it to adhere in great numbers to clothing. This one is apt to be quite abundant in gardens, Indian-corn fields, &c. and if permitted to mature its fruit, becomes very annoying, in the latter part of summer.

2. *B. chrysanthemoides*, Mx. Leaves oblong-lanceolate, tapering at each end, serrate, sessile, and connate at base ; heads conspicuously radiate, often somewhat nodding ; outer scales of the involucre foliaceous, mostly shorter than the rays ; akenes oblong-cuneate, 2–4-awned, retrorsely aculeate-ciliate on the margins.

CHRYSANTHEMUM-LIKE *BIDENS*. Beggar-ticks.

Plant glabrous. *Root* annual. *Stem* 6 inches to 2 feet high, erect or often declined at base, branching, the branches opposite and axillary. *Leaves* 3–6 inches long. *Heads* rather large, solitary, terminating the branches. Outer scales of the *involucre* about 8, linear-lanceolate, ciliate-serrulate, spreading, the largest sometimes nearly as long as the rays ; the inner scales membranaceous, elliptic or ovate-oblong, nearly equal, about as long as the disk-florets. *Rays* bright yellow, numerous, near an inch long. *Akenes* striate-ribbed and somewhat keeled on the flatted sides ; *awns* usually 4. *Chaff* of the receptacle spatulate-linear, scarious, 3-nerved, yellow, or sometimes purplish at summit.

Low grounds, along swampy rivulets : generally throughout the United States. *Fl.* August–September. *Fr.* October.

Obs. This species is rather showy, when in flower,—and is less inclined than either the preceding or the following to invade cultivated grounds

It is, however, quite an objectionable weed, on account of the vast quantity of its adhesive fruit, in autumn. There appear to be several varieties of the plant,—noticed in TORREY & GRAY'S N. A. Flora.

** *Akenes slender, linear, 4-sided, beaked at summit, mostly smooth.*



3. *B. bipinnata*, L. Leaves bipinnately dissected, petiolate,—the segments lanceolate or oblong-ovate, mucronate, usually narrowed at base; heads few-rayed, small, on slender angular-sulcate terminal and axillary peduncles; outer scales of the involucre scarcely as long as the inner ones; akenes long and slender, 4-angled and grooved, 3–4-awned. **BIPINNATE BIDENS. Spanish Needles.**

Plant glabrous. *Root* annual. *Stem* 2–4 feet high, quadrangular, branched. *Leaves* 2–4 or 5 inches long, deltoid-ovate in the outline; *petioles* 1–3 or 4 inches long. *Heads* oblong, slender; *rays* 3–4, obovate, small, yellow with dark veins; *disk-florets* about 20,

FIG. 125. Spanish Needles (*Bidens bipinnata*.) 126. A mature akene, with 4 downward bristly awns.

yellow. *Akenes* about three fourths of an inch long, somewhat scabrous with short erect hairs. *Chaff* of the receptacle lance-linear, shorter than the akenes.

Gardens and cultivated lots : New England to Florida. *Fl.* August–September. *Fr.* October.

Obs. This, like the *B. frondo'sa*—if not carefully watched and eradicated—is a great pest in cultivated lots,—especially in kitchen gardens and Indian-corn fields. One or two other species, equally worthless as the preceding, are frequently to be met with, in low grounds : but those here given are the most common, and the most annoying,—and therefore most entitled to the notice of the farmer.

14. MARU'TA, Cass. MAY-WEED.

[Etymology obscure.]

Heads many-flowered ; *rays* mostly neutral. *Involucre* hemispherical,—the *scales* imbricated in few series, shorter than the disk. *Receptacle* prominently convex or oblong-conical, chaffy all over or only at summit. *Akenes* obovoid or obconic, ribbed, destitute of pappus. Annual herbs. *Leaves* bi- or tri-pinnately dissected.

1. *M. Cot'ula*, DC. Scales of the involucre with whitish scarious margins ; receptacle conical, chaffy at summit only ; chaff subulate.

Stinking Chamomile. Dog's Fennel. May-weed.

Fr. Maroute. *Germ.* Stinkende Kamille. *Span.* Manzanilla fetida.

Plant strongly fetid. *Stem* 6–12 inches high, mostly erect, somewhat pilose, leafy and much branched. *Leaves* 1–2 or 3 inches long, bi- and tri-pinnately dissected,—the segments short, flat, linear, acute. *Heads* terminal on elongated pubescent peduncles ; *rays* white ; *disk* yellow, prominently convex or subcylindric. *Akenes* oblong or obconic, striate-ribbed, mostly tuberculate in lines, with a minute disk at summit, but no sort of pappus.

Farm-yards and waste places ; throughout the United States : introduced. Native of Europe. *Fl.* June–September. *Fr.* August–October.

Obs. This disagreeable little weed has become extensively naturalized ; and although not apt to spread to an injurious extent over cultivated grounds, it is often quite abundant in lanes and farm-yards, and not easily expelled. The plant possesses tonic and emetic properties, similar to those of Chamomile, and though very nauseous is sometimes used as a substitute for that. It is said that the bruised fresh plant will produce blistering if applied to the skin.

15. AN'THEMIS, L. CHAMOMILE.

[Greek, *Anthemon*, a flower ; in allusion to the great number it bears.]

Heads many-flowered ; *rays* pistillate. *Scales* of the *involucre* imbricated in few series. *Receptacle* conical, with membranaceous chaff among the florets. *Akenes* terete or obtusely quadrangular ; *pappus* minute, coroniform, or sometimes wanting. Annual or perennial herbs. *Leaves* bipinnately dissected.

1. *A. NO'BILIS*, L. Stems simple, numerous, spreading and decumbent, villous ; leaves pinnately dissected, subvillous,—the segments multifid with the sub-divisions linear-subulate ; chaff of the receptacle scarious, lanceolate, not awned at apex, a little shorter than the florets.



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NOBLE ANTHEMIS. Chamomile. Garden Chamomile.

Fr. Camomille Romaine. *Germ.* Die Kamille. *Span.* Manzanilla.

Root perennial, woody. *Stems* simple, but numerous from the root, 4-8 or 10 inches long. *Leaves* 1-2 inches long, sessile. *Heads* terminal on elongated leafless pubescent peduncles; *rays* white, finally reflexed; *disk* yellow, convex and at length conical. *Akenes* with a nearly obsolete crown-form pappus.

Gardens: cultivated. Native of Europe. *Fl.* July. *Fr.* September.

Obs. The whole plant (and particularly the heads of flowers) is a fine

FIG. 127. Mayweed (*Maruta Cotula*), reduced.

aromatic bitter, and deservedly popular as a tonic medicine,—for which purpose it is generally cultivated. It is an old and still prevalent opinion, that this plant thrives better for being trampled upon or kept prostrate, whence it was popularly called "*the Whig Plant*" during the revolutionary contest in the United States. The notion is thus incidentally alluded to by SHAKESPEARE, in the first part of his *King Henry IV.*—"For though the Camomile, the more it is trodden on the faster it grows—yet youth, the more it is wasted the sooner it wears." This is said to be naturalized in Delaware; another species is quite common about New York, *A. arven'sis*, L., which has the leaves less divided and the chaff of the receptacle pointed.

16. ACHILLE'A, L. YARROW.

[Named after *Achilles*, who first used the plant.]

Heads many- or several-flowered; *rays* few and short, pistillate; *tube* of the *disk-florets* obcompressed. *Involucre* ovoid-oblong,—the *scales* imbricated, unequal. *Receptacle* flat or sometimes elongated, chaffy. *Akenes* oblong, obcompressed, somewhat margined, destitute of pappus. Perennial *herbs*. *Leaves* alternate, mostly pinnatifid. *Heads* small, corymbose.

1. *A Millefo'lium*, L. Stem mostly simple; leaves bipinnately dissected,—the segments linear, incised-serrate, acute; corymb compound, fastigate; rays about 5, roundish-obovate.

THOUSAND-LEAF ACHILLEA. Yarrow. Milfoil.

Fr. La Millefeuille. *Germ.* Die Scafgarbe. *Span.* Milenrama.

Stem 2–3 feet high hairy and somewhat lanuginous, mostly simple, corymbose at summit. *Leaves* 2 or 3–6 inches long (the radical ones still longer), nearly sessile, much and finely dissected. *Heads* small, numerous, in a dense terminal fastigate corymb; *rays* white or often tinged with purple, crenate-dentate at apex; *disk-florets* whitish,—the tube sprinkled with resinous particles. *Akenes* obcompressed, slightly margined near the summit, smooth. *Receptacle* small, flat; *chaff* lance-oblong, acute.

Pastures, fence-rows, &c : throughout the United States : introduced. Native of Europe. *Fl.* June–Sept. *Fr.* Aug.–October.

Obs. This foreigner has become completely naturalized. It is an aromatic bitter, and somewhat astringent,—quite popular as a tonic. The English agricultural writers speak of it as a plant of some value, in their pastures; but I believe it is universally regarded here as a mere weed. Certainly it is far inferior to our usual pasture plants,—and I think our cattle rarely eat it. Another species, *A. Ptarmica*, L. (Sneezewort,) is naturalized in some places. It differs from the above in having simple, lance-linear, and sharply serrate leaves, and has much more conspicuous rays.



17. LEUCAN'THEMUM, *Tournef.* OX-EYE DAISY.

[Greek, *Leukos*, white, and *Anthemion*, a flower ; in reference to its white rays.]

Heads many-flowered ; *rays* pistillate, numerous. *Involucre* spreading, broad and nearly flat,—the *scales* imbricated, with scarious margins. *Receptacle* flat or somewhat convex, naked. *Tube* of the *disk-florets* fleshy, obcompressed, and slightly 2-winged. *Akenes* of the disk and ray similar, subterete, striate, destitute of pappus. *Perennial herbs*. *Leaves* alternate, mostly pinnatifid or incised-dentate. *Heads* rather large, solitary and terminal.

FIG. 131. The White-weed or Ox-eye Daisy (*Leucanthemum vulgare*).

1. *L. vulga're*, Lam. Stem erect, somewhat branched; leaves laciniately incised or pinnatifid-dentate,—the cauline ones sessile and somewhat clasping—the radical ones obovate-spatulate, petiolate; scales of the involucre with narrow russet-brown margins.

COMMON LEUCANTHEMUM. Daisy. Ox-eye Daisy. White-weed.

Fr. L'oeil de Beuf. Germ. Die Wucherblume. Span. Margarita mayor.

Stem 1 to near 2 feet high, erect or subdecumbent, angular and striate, somewhat hairy, simple or sparingly branched, but often several from the same root. *Leaves* 1–2 inches long, the upper stem-leaves oblong, the lower ones cuneate-spatulate, and the radical ones obovate or orbicular-spatulate. *Heads* broad; *rays* very white—in length about equal to the diameter of the disk; *disk-florets* yellow. *Akenes* subterete, ribbed, smooth, dark purple between the ribs, destitute of pappus. *Receptacle* slightly convex, dotted.

Fields and meadows, more or less throughout the United States: introduced. Native of Europe. *Fl.* June–Aug. *Fr.* July–September.

Obs. This vile intruder is becoming a great nuisance in our country. In some districts the careless, slovenly farmers have permitted it to get almost exclusive possession of their pasture fields,—rendering them quite white when the plant is in bloom. Cows will occasionally crop a portion of the weed in our pastures,—and I have heard it alleged that it contributes to the making of good butter: but my own observations induce me to regard it as utterly worthless. It is propagated rapidly, and is, moreover, exceedingly difficult to get rid of, when once fully established; so that one negligent sloven may be the source of a grievous annoyance to a whole community. I have understood that annual ploughing and cropping for a few years, is the most effectual remedy for the evil; but then the fence-rows and neighboring fields must be well watched, to prevent the formation and introduction of fresh seed. The Corn Marigold (*Chrysanthemum segetum*, L., a kindred plant)—which is said to be such a pest to the agriculture of Europe—does not appear to have found its way, as yet, to the United States.

18. TANACE'TUM, L. TANSY.

[Corrupted from *Athanasia*, Gr., a, not, and *Thanatos*, death: from its durable flowers.]

Heads with the florets all perfect, with the marginal ones pistillate in a single series. *Scales* of the involucre imbricated, dry. *Receptacle* more or less convex. *Akenes* angled or ribbed, with a large epigynous disk. *Pappus* none or minute, coroniform. Perennial herbs, or suffruticose plants. *Leaves* alternate, dissected. *Heads* corymbose.

1. *T. vulga're*, L. Stem herbaceous, smoothish; leaves bipinnately parted,—the rachis and lobes incised-serrate; heads heterogamous, numerous, in a dense fastigate corymb; pappus coroniform, of five equal lobes.

COMMON TANACETUM. Tansy.

Fr. Tanaisie. Germ. Der Rainfarn. Span. Tanaceto.

Stems 2–4 feet high, somewhat branched above, often growing in clusters. *Leaves* 2 or 3–6 or 8 inches long, interruptedly pseudo-pinnate—the segments pinnatifid, unequally incised-serrate. *Heads* depressed-hemispherical; *involucre* smoothish,—the outer scales lanceolate, acuminate—the inner ones oblong, obtuse; *florets* deep yellow, numerous and densely crowded, the marginal ones trifid, obsolete radiate. *Receptacle* nearly flat.

Gardens, fence-rows, way-sides, &c.: introduced. Native of Europe. *Fl.* July–Aug. *Fr.* September.

Obs. This was originally introduced as a garden-plant, and generally cultivated for its aromatic bitter properties,—which have rendered it a prominent article in the popular *Materia Medica*. It has now escaped from the gardens, and is becoming naturalized—and something of a weed—in many places.

19. ARTEMISIA, L. WORMWOOD.

[Said to be so called from *Artemis*,—one of the names of Diana.]

Heads discoid, few- or many-flowered, the marginal florets pistillate in a single series, and 3-lobed,—or sometimes the heads are with the florets all perfect. *Scales* of the *involucre* imbricated, mostly dry, with scari-ous margins. *Receptacle* flattish or convex, naked or villous. *Akenes* obovoid, with a small epigynous disk, destitute of pappus. *Herbaceous* or *fruticose*—mostly perennial plants. *Leaves* alternate, usually pinnatifid. *Heads* small, racemose, or paniculately spicate.

* *Receptacle* naked; the central or disk-florets sterile.

1. A. DRACUN'CULUS, L. Herbaceous, green and glabrous; stem erect, branching; radical leaves trifid at apex,—stem-leaves linear-lanceolate, sub-dentate or entire; heads subglobose, racemose-paniculate.

LITTLE DRAGON ARTEMISIA. Tarragon.

Fr. Estragon. *Germ.* Esdragon. *Span.* Estragon.

Root perennial. *Stem* 2–3 feet high. *Leaves* 1–2 or 3 inches long, mostly entire sessile, narrowed at each end, those on the branches smaller. *Heads* small. *Florets* yellowish.

Gardens: cultivated. Native of Russia and Siberia. *Fl.* August. *Fr.* September.

Obs. This species is sometimes cultivated in the kitchen gardens of the curious, for the sake of its aromatic herbage. It is said to impart a fine flavor to vinegar by steeping a bunch of the green herb in that liquid.

* * *Receptacle* hairy; the florets all fertile.

2. A. ABSIN'THIUM, L. Silky-canescens; stem suffruticose, angular-sulcate, paniculately branched above; leaves bipinnatifid,—the segments lanceolate, often incised; heads hemispherical, racemose-paniculate, nodding.

Worm-wood.

Fr. L'Absinthe. *Germ.* Der Wermuth. *Span.* Axenjo.

Plant hoary with a short and rather dense silky pubescence. *Root* perennial. *Stems* 2–4 feet high, clustered or numerous from the root. *Leaves* 1–2 or 3 inches long, petiolate, multifid or irregularly bipinnatifid,—the principal segments often trifid and cuneate at

base, the sub-divisions elliptic-oblong, obtuse, entire. *Heads* numerous, in leafy paniculate racemes; *florets* yellowish. *Akenes* obconic-oblong, smooth.

Gardens: cultivated. Native of Europe. *Fl.* August. *Fr.* Sept. – October.

Obs. This plant— proverbial for its bitterness—is generally kept in gardens; and is valuable for its medicinal properties, as a tonic, vermifuge, &c., and is occasionally seen growing spontaneously along roads and lanes.

There is another species (*A. ABROTA'NUM*, *L.*), commonly known by the name of “Southern-wood,” or “Old Man,” frequent in gardens; and a fourth (*A. VULGA'RIS*, *L.*), called “Mug-wort,” is occasionally met with; but these are of less importance, and scarcely entitled to a place here.

20. GNAPHA'LIUM, *L.* CUDWEED.

[Greek, *Gnaphalon*, soft down or wool,—with which the plants are clothed.]

Heads many-flowered; *florets* all tubular,—the outer ones pistillate, very slender, mostly in several series—the central ones perfect. *Involucre* ovoid; *scales* imbricated, appressed, scarious or hyaline. *Receptacle* flat. *Akenes* subterete. *Pappus* in a single series, capillary and scabrous. *Herbs* mostly woolly or tomentose. *Leaves* sessile or decurrent. *Heads* corymbose, glomerate, or spicate.

1. *G. polyceph'alum*, *Mx.* Stem herbaceous, erect, paniculately branched; leaves linear-ob lanceolate, acute, sessile and not decurrent, smoothish above, tomentose beneath; heads numerous, in terminal corymbose clusters.

MANY-HEADED GNAPHALIUM. Life-everlasting.

Root annual. *Stem* 1–2 feet high, hoary-tomentose and generally much branched. *Leaves* 1–3 inches long, somewhat undulate on the margins, green and nearly smooth on the upper surface, whitish and densely tomentose beneath. *Heads* rather small, oblong-ovoid, ochroleucous, aggregated in dense terminal clusters, very fragrant. *Florets* slender, yellowish. *Akenes* oblong, subterete, smooth. *Pappus* somewhat tawny.

Old fields and pastures: Canada to Texas. *Fl.* Aug. – Sept. *Fr.* October.

Obs. This is often quite abundant in old pasture fields; and although not a pernicious plant, it is altogether valueless to the farmer, and must be regarded as a mere weed.

21. ERECHTHI'TES, *Rafin.* FIRE-WEED.

[The ancient Greek name of some species of Groundsels.]

Heads many-flowered, discoid; marginal *florets* pistillate, very slender, 2–3-toothed,—the others perfect, 4–5-toothed. *Involucre* cylindrical,—the *scales* in a single series, linear, acute, bracteolate. *Receptacle* naked, somewhat papillose. *Akenes* oblong, striate, somewhat attenuated at apex. *Pappus* copious and smoothish, of very fine capillary bristles in several series. *Annual herbs.* *Heads* corymbose.

1. *E. hieracifo'lia*, Raf. Stem simple, or paniculate at summit; leaves lance-oblong, narrowed at base, acute, unequally incised-dentate, sessile,—the upper ones often sagittate-auriculate and somewhat clasping.

HIERACIUM-LEAVED ERECHTHITES. Fire-weed.

Stem 2–4 or 5 feet high, rather large, succulent and tender when young, striate-sulcate, more or less hairy, sometimes nearly smooth. *Leaves* 3–6 or 8 inches long. *Heads* middle-sized, often numerous, in small cymose corymbe terminating the paniculate branches; *involucre* terete-oblong, slightly ventricose; *florets* whitish or ochroleucous, very slender and numerous. *Pappus* very white, of numerous fine and almost silky hairs. *Receptacle* flat, roughish-dotted.

Moist grounds, recent clearings, &c.: throughout the United States. *Fl.* July–August. *Fr.* September.

Obs. This plant (which has much the aspect of a *Sonchus*, or Sow-thistle) is remarkable for its prevalence in newly cleared grounds, —especially in and around the spots where brush-wood has been burnt; whence its common name, “Fire-weed.” It is a coarse, worthless weed, and often very abundant in new grounds; but it is not apt to be troublesome in cultivated fields.



22. SENE'CIO, L. GROUNDSEL.

[Latin, *Senex*, an old man; the pappus resembling a white beard.]

Heads many-flowered,—either discoid with the florets all tubular and perfect—or radiate with the ray-florets pistillate. *Involucre* subcylindric with the scales in a single series, or calyculate with a few accessory scales. *Receptacle* naked. *Akenes* not beaked nor winged—often grooved or ribbed. *Pappus* of numerous very slender caducous

hairs. *Herbs* with alternate leaves and solitary or corymbose heads.

* *Heads* without rays; root annual.

1. *S. vulga'ris*, L. Leaves pinnatifid and dentate,—the lowest petiolate, the upper clasping; heads nodding.

COMMON SENECEO. Groundsel.

Stem 6–12 inches high, paniculately branching, angular, mostly smoothish. *Leaves* 1–3 inches long,—the upper ones somewhat auricled and clasping,—the lower ones on petioles $\frac{1}{2}$ an inch to an inch in length. *Involucre* somewhat obconical, smooth; scales often sphacelate, or blackish at apex, bracteolate at base. *Akenes* pubescent on the ribs.

Obs. A homely little weed in waste grounds from New Engand to Pennsylvania. DE CANDOLLE says that it has migrated almost everywhere with European men; but whether it is likely to become troublesome to our farmers is not yet ascertained.

** *Heads radiate, corymbose; root perennial.*

2. *S. au'reus*, L. Smooth, or often somewhat arachnoid-woolly when young; radical leaves roundish-ovate and subcordate, or varying to obovate and oblong-lanceolate, crenate-serrate, petiolate; lower stem-leaves lyrate—the upper ones lanceolate, pinnatifid, sessile or partly clasping; corymb subumbellate.

GOLDEN SENECEO. Golden Ragwort. Squaw-weed.

Stem 1–2 feet high, corymbosely branched,—the lower branches elongated, axillary and distant—the upper ones crowded or subumbellate at the summit of the stem. *Leaves* 1–3 inches long, varying in form on the different varieties; *petioles* of the radical leaves 1 or 2–6 or 8 inches long. *Heads* terminal on the fastigate branches; *rays* and *disk* yellow. *Akenes* linear-oblong, striate-ribbed; *pappus* white.

Banks of streams, moist sterile fields, and meadows: throughout the United States.
Fl. April–June. *Fr.* June–July.

Obs. A very variable plant, some forms of which have been described as species. The principal varieties are, var. *obovatus*, with round-obovate root-leaves; this usually grows in dryer places than the var. *Balsamitæ*, which has the root-leaves oblong, spatulate, or lanceolate, sometimes cut-toothed, tapering into the petiole. The last named variety is a frequent weed in poor moist meadows and pastures, where the farmer may often see patches, in the spring, made conspicuous by its yellow rays. The var. *obovatus* (called “Squaw-weed”) has been denounced, by an Agricultural writer in New York, as being poisonous to sheep; but I know not how correctly, and am rather inclined to doubt the accuracy of the statement. The Senecios are a multitudinous family. Prof. DE CANDOLLE describes nearly 600 species—of which about 40 are enumerated by TORREY & GRAY as inhabitants of North America. Although the species are so numerous, and, I believe, altogether worthless, I do not know that they have been found very troublesome on the farm.

23. CENTAURE'A, L. STAR-THISTLE.

[From the *Centaur*, Chiron,—who, it is said, cured his wound with the plant.]

Heads many-flowered; florets unequal,—the marginal ones larger and neutral, or sometimes wanting,—the central ones perfect. *Involucre* roundish ovoid, the *scales* variously margined or appendaged. *Receptacle* bristly. *Akenes* compressed. *Pappus* usually composed of scabrous fili-

form bristles in one or more series—the inner series often smaller and somewhat connivent. Polymorphous *herbs*. *Leaves* alternate. *Heads* solitary, large.



1. *C. Cy'anus*, *L.* Covered with a loose cottony down; stem erect, much branched; leaves lance-linear, sessile, entire—the lower ones broader, tapering into a kind of petiole, toothed or pinnatifid at base; pappus shorter than the akene.

BLUE CENTAUREA. Blue-bottle. Ragged Robin. Blue Bonnets, of the Scotch.

Fr. Bluet. *Germ.* Die Korn-blume. *Span.* Ci'ano.

Root annual. *Stem* 1–2 or 3 feet high. *Leaves* 2–6 inches long, hoary-villous or lanuginous—especially on the under side. *Heads* roundish-ovoid, pedunculate, not bracteate; outer scales of the involucre ovate-serrate,—the inner ones longer, lanceolate, scarious and entire below, serrate near the apex. *Florets* of the centre regular, with a slender tube, mostly violet-purple,—the marginal ones obsoletely pistillate, larger, spreading or recurved, funnel-form with a long tube, blue, or sometimes purplish or white. *Akenes* oblong, compressed, striate, pilose, with a cavity (*areola*) on one side of the base; *pappus* composed of numerous russet scabrous hairs of unequal length.

Gardens and cultivated fields: Northern and Middle States: introduced. Native of Europe. *Fl.* July. *Fr.* August.

Obs. This plant is often seen in gardens, and in some places is gradually straggling into the cultivated fields. As it is considered a troublesome weed, among the grain crops of Europe, it may be well to watch and arrest its progress here. Every worthless intruder should be regarded with a jealous eye, by the farmer. *C. ni'gra* and *C. Calci'trapa*, *L.*, are naturalized to some extent; the former, known as "Knapweed," has the scales of the involucre margined with a short black fringe and short pappus—principally in New England. *C. Calci'trapa*, or "Star Thistle," has the middle scales of the involucre terminating in spines, and no pappus.—Virginia.

24. CYNA'RA, *Vaill.* ARTICHOKE.

[Greek, *Kyon*, *kynos*, a dog; the spines of the involucre resembling dogs' teeth.]

Heads many-flowered; florets all equal. *Involucre* ovoid—the scales imbricated, coriaceous, produced into a lanceolate appendage which is

FIG. 132. The Bluebottle (*Centaurea Cyanus*). 133. A divided head, showing a marginal and disk flower remaining on the bristly receptacle.

spinescent at apex. *Receptacle* flat, fimbriate or bristly-chaffy. *Corolla* 5-cleft—the limb thick at base, half as long as the tube, the lobes very unequal. *Akenes* obovate compressed or 4-sided, smooth. *Pappus* in several series, long, plumose—the bristles free at base, but attached to a deciduous ring. Perennial spinose *herbs*. *Leaves* alternate, pinnatifidly lobed, not decurrent. *Heads* large, with a thick fleshy receptacle.

1. *C. SCOLYM'US*, L. Stem branching; leaves subspinose, bipinnatifid and sometimes undivided, tomentose beneath; scales of the involucre ovate, thick and fleshy at base, obtuse at apex and somewhat emarginate—rarely subspinescent, straight or slightly divergent.

Artichoke.

Fr. Artichaud. *Germ.* Die Artischoke. *Span.* Alcachofa.

Root perennial. *Stem* 3–5 feet high, stout, striate and tomentose. *Leaves* large, entire or lobed and spinose. *Heads* ovoid, 2–3 inches in diameter; *florets* blue or violet-purple. Gardens: cultivated. Native country uncertain. *Fl.* Aug. *Fr.* Sept.

Obs. The thick receptacle, together with the fleshy bases of the scales of the involucre, affords a favorite vegetable dish,—for which this plant is cultivated. Another species, called CARDOON (*C. Cardunculus*, L.), with the leaves all bipinnately lobed, and more spinose, to which the foregoing is nearly allied (if, indeed, it be not, as Prof. DE CANDOLLE suggests, a mere variety produced by long culture), is also cultivated for the thick fleshy petioles and ribs of the leaves, which are rendered delicate and white by etiolation, or blanching, after the manner practiced with Celery.

25. CIR'SIUM, Tournef. THISTLE.

[Greek, *Kirsos*, a varix, or enlarged vein; for which the plant was a supposed remedy.]

Heads many-flowered; *florets* all similar and perfect, or rarely imperfectly dioecious. *Involucre* subglobose; *scales* imbricated in numerous series, mostly cuspidate or tipped with a spine. *Receptacle* fimbriate. *Akenes* oblong, compressed, not ribbed, glabrous. *Pappus* of many series, the hairs united into a deciduous ring at base, plumose, merely denticulate (the stouter ones slightly clavellate) at apex. Biennial or perennial *herbs*. *Leaves* alternate, sessile or decurrent, often pinnatifid with the margins and segments spinose,—the radical ones much larger than the cauline, as is usual with *biennials*.

* *Involucral scales* all tipped with spreading prickles.

1. *C. lanceola'tum*, Scop. Leaves decurrent on the stem and forming a spinose lobed wing, pinnatifid, prickly hispid on the upper surface, cobwebby beneath—the segments lanceolate, bifid, divaricate, spinose; involucre ovoid, nearly bractless; scales linear-lanceolate, tipped with a spine, the outer ones spreading.

LANCEOLATE CIRSIUM. Common Thistle.

Fr. Chardon lanceole. *Germ.* Die Kratzdistel. *Span.* Cardo.

Root biennial. *Stem* 2-4 feet high, branched, striate-sulcate, hairy, winged by the decurrent leaves. *Leaves* 4-8 or 12 inches long. *Heads* terminal, erect, about an inch in diameter; *scales* of the involucre connected by a cobweb-like villus. *Florets* purple, with yellowish anthers. *Akenes* small, obovate-oblong; *pappus* about an inch long, silky.

Pastures, fence-rows, way-sides, &c.: Northern and Middle States: introduced. Native of Europe. *Fl.* June-July. *Fr.* July-August.

Obs. This foreigner, which delights in a rich soil, is abundantly naturalized in the Northern States, generally. Though not so repulsive and ugly as some others of the spinose Compositæ, it is nevertheless a very objectionable weed on the farm, and requires constant vigilance and attention to exclude it, or keep it in subjection. If permitted to mature its fruit, the spreading pappus may be seen, by hundreds, floating the akenes through the air, and disseminating the noxious intruder far and wide.

** *Scales of the involucre appressed; the inner ones not prickly: filaments hairy.*

† *Leaves white, woolly beneath.*

2. C. dis'color, Spreng. Leaves deeply pinnatifid, sparsely hairy and green above, densely hoary-tomentose beneath—the segments linear-lanceolate, cuspidate and spinulose-ciliate; involucre ovoid-oblong; scales appressed, tipped with a slender prickle—the outer or lower scales lance-ovate, the inner or upper ones linear-lanceolate.

TWO-COLORED CIRSIUM.

Root biennial. *Stem* 2-5 feet high, with rather slender spreading leafy branches, striate, pubescent with crisped membranous hairs. *Leaves* 3 or 4-12 or 15 inches long (those on the branches small), the under surface bluish-white with a soft dense tomentum. *Heads* 1-2 inches long, and an inch or more in diameter; *scales* somewhat arachnoid-villous. *Florets* reddish-purple, with whitish anthers.

Fields and borders of thickets: Northern and Western States. *Fl.* Aug.-Sept. *Fr.* Sept.-October.

Obs. Like all others of the genus, this is a worthless, obnoxious weed, but is much easier kept in subjection than the preceding.

†† *Leaves green on both sides, or with loose woolly hairs beneath; scales of the involucre scarcely prickly pointed.*

3. C. pu'milum, Spreng. Leaves semi-amplexicaul, pinnatifid, green on both sides—the segments short, irregularly lobed, spinulose-ciliate and pointed with strong sharp spines; heads few and large, roundish-ovoid, bracteate; scales of the involucre appressed—the outer ones ovate-lanceolate, acuminate, tipped with a short spine, the inner ones lance-linear with acuminate scarious serrulate tips.

LOW OR DWARF CIRSIUM. Pasture Thistle.

Plant pale greyish green. *Root* biennial. *Stem* 1-2 feet high, stout, sparingly branched, striate, retrorsely pilose. *Leaves* 4-12 inches long, very prickly, more or less hairy, densely pilose on the midrib beneath. *Heads* few (1-3), often near 2 inches in diameter, mostly with large pinnatifid spinose bracts at base. *Florets* often 2 inches in length, usually of a pale reddish-purple, with whitish anthers.

Neglected old fields and low grounds: Middle and Northern States. *Fl.* July. *Fr.* August.

Obs. The flowers of this species are quite fragrant, and the heads somewhat showy or conspicuous, being larger than those of any other native thistle. It does not disseminate rapidly, and is therefore easily kept in subjection by proper attention.

4. *C. horrid'ulum*, *Mx.* Leaves semi-amplexicaul, pinnatifid, lanuginous beneath—the short segments toothed or incised, strongly spinose; involucre ovoid, large, with a verticil of pectinately spinose bracts at base; scales loosely imbricated, linear-lanceolate, tapering to a subulate point, but scarcely spinose.

SOMEWHAT RUGGED *CIRSium*. Yellow Thistle.

Root biennial? (perennial, *DC.*). *Stem* 18 inches to 2–3 feet high, rather stout, simple or sparingly branched, arachnoid-lanuginous when young, finally smoothish. *Leaves* 4–12 inches long, hairy on the upper surface, lanuginous beneath,—the segments pointed with short rigid spines. *Heads* terminal, few, (often but one), nearly as large as in the preceding species, surrounded at base by a whorl of numerous (10–20 or 30) linear-lanceolate bracts, about as long as the involucre,—the bracts subpinnatifid or sinuate-dentate, pectinately spinose, with the spines somewhat in pairs, or fascicled. *Florets* an inch to an inch and a half long, pale yellow (sometimes purple? or becoming purple in drying?).

Pastures and waste places: sea coast, from Massachusetts to Louisiana: introduced. *Fl.* July. *Fr.* August.

Obs. A rugged and repulsive plant, which is very common on the seashore, and which it is very desirable should remain a stranger to our farms.

* * * *Scales of the appressed involucre barely prickly pointed; filaments nearly smooth; heads imperfectly dioecious.*

5. *C. arven'se*, *Scop.* Rhizoma creeping; stem rather slender, striate-angled, paniculately branched at summit; leaves sessile, lance-oblong, sinuate-pinnatifid and dentate, undulate, ciliate-spinose; heads numerous, small; involucre oblong-ovoid; scales appressed, lance-ovate, mucronate,—a few of the outer ones cuspidate-spinose.

FIELD *CIRSium*. Canada Thistle. Cursed Thistle.

Fr. Chardon aux Anes. *Germ.* Die Acker Kratzdistel.

Rhizoma perennial,—creeping horizontally 6–8 inches below the surface of the ground, and giving off numerous erect biennial branches. *Stem* 18 inches to 3 feet high, slender and smoothish,—the branches slender and lanuginous. *Leaves* 4–8 or 10 inches long, sessile and slightly decurrent, smoothish on the upper surface, sometimes arachnoid-lanuginous beneath,—the radical ones curled or wavy. *Heads* half an inch to two-thirds of an inch in diameter, terminal, sub-pedunculate; *scales* smoothish, minutely ciliate. *Florets* palish lilac-purple, with whitish anthers, perfect or the heads dioecious by abortion. *Akenes* linear-oblong, slightly 4-cornered; *pappus* finally longer than the florets.

Fields and way-sides: Northern and Middle States: introduced. Native of Europe. *Fl.* July. *Fr.* August.

Obs. This is, perhaps, the most execrable weed that has yet invaded the farms of our country. The rhizoma or subterranean stem (which is perennial and very tenacious of life), lies rather below the usual depth of furrows—and hence the plant is not destroyed by common ploughing. This rhizoma ramifies and extends itself horizontally in all directions,—sending up branches to the surface, where radical leaves are developed



the first year—and aërial stems the second year. The plant appears to lie at the end of the second summer; but it only dies down to the horizontal subterranean stem. The numerous branches sent up from the rhizoma, soon cover the ground with the prickly radical leaves of the plant; and thus prevent cattle from feeding where they are. Nothing short of destroying the perennial portion of the plant will rid the ground of this pest; and this, I believe, has been accomplished by a few years of continued culture (or annual cropping of other plants, that require frequent hoeing, or dressing with the hoe,)—so as to prevent the development

FIG. 134. The Canada Thistle (*Cirsium arvense*), reduced.

of radical leaves, and deprive the rhizoma of all connection or communication with the atmosphere.

The following notice of this annoying weed, from CURTIS' *Flora Londinensis*, may not be uninteresting to the American farmer :

"*Vitium agrorum apud nos primum est* [it is the greatest pest of our fields,] LINNÆUS observes in his *Flora Lapponica*. The same may be said with us : and we have bestowed on this plant the harsh name of *cursed*, with a view to awaken the attention of the Agriculturists of our country to its nature and pernicious effects.

"Repeated observation has convinced us that many husbandmen are ignorant of its economy,—and while they remain so, they will not be likely to get rid of one of the greatest pests which can affect their corn-fields and pastures. Of the thistle tribe the greatest part are annual or biennial, and hence easily destroyed. Some few are not only perennial, but have powerfully creeping roots,—and none so much as the present. In pulling this plant out of the ground, we draw up a long slender root, which many are apt to consider as the whole of it ; but if those employed in such business examine the roots so drawn up, they will find every one of them broken off at the end : for the root passes perpendicularly to a great depth, and then branches out horizontally under ground."

Two or three other species of *Cirsium* are frequently to be met with, (viz. : *C. muticum*, *Mx.*, with the heads not spinose,—and *C. altissimum*, *Spreng.*, with the stem-leaves not pinnatifid) : but, as they do not incline much to infest the open grounds or farm-land, I have not judged it necessary to notice them more particularly here.

26. ONOPORDON, *Vaill.* COTTON THISTLE.

Heads and flowers nearly as in *Cirsium*. *Scales* of the involucre coriaceous, tipped with a lanceolate prickly appendage. *Receptacle* deeply honey-combed. *Achenia* 4-angled, wrinkled. *Pappus* of numerous bristles, slender, not plumose, united at the base into a horny ring. *Coarse herbs* ; the stem winged with the decurrent base of the prickly-lobed leaves.

1. *O. Acanthium*, *L.* Stem and leaves cotton-woolly ; scales of the involucre linear awl-shaped.

Cotton Thistle.

Annual. *Stem* 2-4 feet high, broadly winged by the decurrent edges of the leaves. *Leaves* ovate-oblong, sinuate and spinose, woolly on both sides but most so beneath. *Flowers* large purple, solitary at the end of the branches. *Involucre* globose, of numerous lanceolate very pungent scales, green with yellowish tips, the upper ones nearly erect, the middle ones spreading, the lowermost reflexed, all connected by a cottony web. *Pappus* scarcely half the length of the florets, jointed, rough downwards.

Naturalized from Europe. July - August.

Obs. A coarse thistle-like plant, conspicuous by the white cottony appearance of its stem and leaves. Very common along road-sides and in waste places in New England. This is said to be the true Scotch thistle, the national emblem.

27. LAP'PA, *Tournef.* BURDOCK.[Greek, *labein*, to seize ; from its adhesive involucre.]

Heads many-flowered ; *florets* all perfect and similar. *Involucre* globose ; *scales* imbricated, coriaceous, appressed at base, spreading and subulate above, with the rigid apex uncinately incurved. *Receptacle* bristly. *Akenes* oblong, compressed, transversely wrinkled. *Pappus* in several series, short, filiform, scabrous, not united into a ring at base, caducous. Biennial *herbs*, coarse and branching. *Leaves* alternate, subcordate, petiolate, large. *Heads* rather small, solitary or somewhat corymbose.

1. *L. ma'jor*, *Gärtn.* Lower leaves cordate-oblong, upper ones ovate ; scales of the involucre all subulate with uncinuate tips, smooth or loosely arachnoid.

GREATER LAPPA. Bur-dock.

Fr. Glouteron. *Germ.* Die Klette. *Span.* Bardána Lampazo.

Root biennial. *Stem* 2-4 or 6 feet high, paniculately branching, striate-sulcate, roughish-pubescent. *Leaves* green and roughish pubescent above, paler and arachnoid-tomentose beneath,—the *radical* ones 1-2 feet long, erosely dentate and undulate on the margin, (sometimes pinnatifid, or coarsely and deeply dentate) ; *petioles* 9-18 inches long ; *stem-leaves* smaller, and more or less ovate. *Heads* roundish-ovoid, on short peduncles, terminal and axillary ; *scales* of the *involucre* subulate-lanceolate, keeled, minutely serrulate, smoothish, spreading, with the point incurved and hooked. *Florets* purple, with bluish anthers. *Akenes* compressed, angular, rugose. *Receptacle* limbrillate,—the bristly chaff smooth, longer than the akenes.

Fence-rows and waste places : introduced. Native of Europe. *Fl.* July-September. *Fr.* September-October.

Obs. Everybody knows this coarse homely weed, wherever it has gained admittance,—but everybody does not take care to keep it in due subjection. One of the earliest and surest evidences of slovenly negligence about a farm-yard, is the prevalence of huge Bur-docks. The plant is considerably bitter ; and the leaves are a favorite external application in fevers, head-ache, &c.

28. CICHO'RIUM, *Tournef.* SUCCORY.[Etymology obscure : perhaps from *Chicouryeh*, the Arabic name of the plant.]

Heads usually many-flowered. *Involucre* double,—the outer one of about 5 short spreading scales—the inner one of 8-10 scales. *Akenes* turbinate, somewhat compressed and angular, striate, glabrous. *Pappus* of numerous very small chaffy scales. Branching *herbs* ; *flowers* bright blue, showy.

1. *C. Inty'bus*, *L.* Radical leaves runcinate, hispidly scabrous on the midrib,—the cauline ones small, oblong or lanceolate, partly clasping, sinuate-dentate or entire—those of the branches inconspicuous ; heads axillary, subsessile, mostly in pairs.

Wild Succory. Chicory.

Fr. La Chicorée sauvage. *Germ.* Der Wegewart. *Span.* Achicoria.



FIG. 135. Wild Cichory or Succory (*Cichorium Intybus*), the size much reduced,
136. A separate head, the flowers all strap shaped.

Root perennial, somewhat fusiform. *Stem* 2-4 feet high, angular-striate, roughish-pubescent, with numerous and somewhat virgate scabrous branches. *Radical leaves* 4-8 or 10 inches long, numerous. *Heads* axillary on the side of the stem and branches, in pairs or often solitary. *Florets* blue, or sometimes purplish—and not unfrequently white—all ligulate and radiating towards the circumference. *Pappus* of minute chaffy scales, oblong, obtuse or emarginate, in a double series.

Fields and meadows: Northern and Middle States: introduced. Native of Europe. *Fl.* August. *Fr.* September - October.

Obs. This foreigner is becoming extensively naturalized. Some European Agriculturists recommend it as a valuable forage plant,—though they admit that it gives a bad taste to the milk of cows which feed upon it. In this country, it is generally—and I believe justly regarded as an objectionable weed, which ought to be expelled from our pastures. The roasted root has been used on the continent of Europe, as a substitute for the Coffee-berry; but those who delight in the aromatic beverage, are not likely to take much interest in this or any other substitute for the genuine article.

2. *C. ENDIVIA*, *Willd. var. sati'va*, *DC.* Radical leaves somewhat erect, obovate-oblong, sinuate-dentate, and often pinnatifid, smoothish,—the cauline ones auriculately dilated at base; heads sessile and aggregated in twos and fours in the axils of the upper leaves, or solitary on elongated branches.

Endive. Garden Succory.

Fr. La Scarole. *Germ.* Die Endivie. *Span.* Endibia.

Root biennial—or sometimes annual. *Stem* 2-3 feet high, terete, fistular, somewhat branched, smoothish, or often sparsely hirsute. *Radical leaves* 6-12 inches long, sinuate-dentate with the teeth varying from large to very small and numerous, sometimes pinnatifid with the margin curled and lacerate, slender and tapering to the base. Outer scales of the *involucre* hispid-ciliate. *Florets* violet-purple, or sometimes white,—the ligules at first involute. *Akenes* turbinate or obconic, somewhat compressed, angular and ribbed; *pappus* of minute chaffy scales in a double series.

Gardens: cultivated. Native of India. *Fl.* July - August. *Fr.* September.

Obs. Cultivated for the young radical leaves,—which are etiolated or blanched by the exclusion of light, and used as a salad.

29. LEON'TODON, L. FALL DANDELION.

[Greek, *leon*, a lion, and *odous*, a tooth; from the toothed leaves.]

Heads many-flowered. *Involucre* scarcely imbricated, but with several bractlets at the base. *Achenia* spindle-shaped, striate, all similar. *Pappus* of plumose bristles, enlarged towards the base, persistent. Low, stemless perennial herbs, with toothed or pinnatifid root-leaves, the scapes bearing one or more yellow heads.

1. *L. autumnale*, *L.* Leaves more or less pinnatifid; scape branched; peduncles thickened at the summit, and furnished with small scaly bracts; pappus, tawny, of a single row of equal bristles. June to Nov. Hawkbit. Fall Dandelion.

Obs. This introduced plant is especially abundant in New England,

where it infests grass plots, beginning to flower in June, and continuing until the frost. The flowers much resemble those of the Dandelion. Varies with the leaves, more or less hispid.

30. TRAGOPO'GON, *Tournef.* SALSIFY.

[Greek, *Tragos*, a goat, and *Pogon*, a beard ; in allusion to the pappus.]

Heads many-flowered. *Involucre* in a nearly single series ; *scales* 8 – 16, somewhat united at the base, finally reflexed. *Akenes* sessile, with a lateral *areola* at base, scabrous, terminating in a long continuous beak. *Pappus* in several series,—all plumose except the 5 outer ones, which are longer than the rest. Biennial or perennial *herbs*. *Leaves* sublinear, with parallel nerves.

1. *T. PORRIFO'LIUM*, *L.* Glabrous ; leaves lance-linear, acuminate, very entire ; penduncles somewhat obconical, fistular ; scales of the involucre about 8, lanceolate, acute, longer than the florets.

LEEK-LEAVED TRAGOPOGON. Oyster-plant. Salsify.

Fr. Salsifis. *Germ.* Der Bock-bart. *Span.* Barba cabruna.

Plant glabrous and somewhat glaucous. *Root* biennial? (annual *DC.*), fleshy and fusiform. *Stem* 3–4 or 5 feet high, sparingly and somewhat dichotomously branched. *Leaves* 6–12 or 15 inches long, ovately dilated at base, and tapering to a long narrow acumination, keeled, sessile and semi-amplexicaul, somewhat distichous. *Heads* terminal, on enlarged clavate hollow peduncles. *Florets* violet-purple with a fuscous tinge. *Akenes* lance-oblong, striate-sulcate, scabrous, tapering to a smooth slender beak, about an inch in length, and supporting the pappus at summit.

Gardens : cultivated. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This is frequently cultivated for its fleshy *root*,—which, when properly cooked, has something of the flavor of fried *Oysters* ; whence one of its common names.

31. TARAX'ACUM, *Haller.* DANDELION.

[Greek, *Tarasso*, to stir or disturb ; in allusion to its supposed active properties.]

Heads many-flowered. *Involucre* double,—the outer scales small, appressed, spreading or reflexed—the inner ones erect, in a single series. *Akenes* oblong, striate-ribbed or angled, minutely muricate on the ribs, often spinulose at summit,—the apex abruptly produced into a long slender beak. *Pappus* in many series, capillary, very white. Perennial *stemless herbs* : *leaves*, consequently, all radical. *Heads* of flowers mostly solitary, on simple fistular naked *scapes*.

1. *T. Dens-leo'nis*, *Desf.* Leaves lance-oblong, unequally and acutely runcinate,—the lobes triangular, dentate anteriorly ; scales of the involucre not corniculate at apex, the outer ones reflexed.

LION-TOOTH TARAXACUM. Dandelion.

Fr. Dent de Lion. *Germ.* Der Loewenzahn. *Span.* Amargon.

Plant at first somewhat pubescent, at length smooth. *Root* perennial. *Leaves* 4–10 or 12 inches long. *Scapes* several from the same root. 4–12 or 15 inches long (elongating),



terete, each bearing a single head. *Involucre* oblong,—the inner scales lance-linear, appressed, with scarious margins—the outer ones reflexed, slightly ciliate,—finally the entire involucre reflexed. *Florets* yellow. *Akenes* terminating in a *beak*, which is short at first, then suddenly elongating to about three-fourths of an inch in length, filiform, bearing the pappus at summit, diverging so as to form a globose head.

Pastures, &c.: nearly throughout the United States: introduced. Native of Europe. *Fl.* April–August. *Fr.* May–September.

Obs. This foreigner—although not a very obnoxious plant—has become so thoroughly naturalized as to be more abundant than we come, in our pasture-grounds and meadows: and yet, if it cannot be repressed or smothered out by better plants, it will be a difficult task to extirpate it,—as myriads of seeds are annually wafted over the country by

FIG. 137. Flower and leaf of the common Dandelion (*Taraxacum Dens-Leonis*). 138. An enlarged separate floret. 139. A receptacle with a portion of the akenes remaining. 140. An enlarged akene with the pappus at the end of its elongated beak.

means of the pappus. The plant is medicinal, and is popular as a remedy in diseases of the liver. The leaves are used as a pot-herb, or "greens," and the young radical leaves, when blanched, are said to make a good substitute for Endive.

32. LACTU'CA, Tournef. LETTUCE.

[Latin, *Lac*, milk ; in reference to its milky juice.]

Heads few, or several-flowered. *Involucre* subcylindrical ; *scales* in 2-4 series,—the outer ones shorter and broader. *Akenes* flatly obcompressed, wingless, abruptly produced into a filiform beak. *Pappus* in several series of soft white hairs. Leafy-stemmed caulescent herbs. *Heads* of flowers paniculate or corymbose.

1. *L. SCARIO'LA*, var. *SATI'VA*, *Moris*. Stem corymbosely branching, leafy ; radical leaves erect, oval, narrowed at base, wavy,—the cauline ones cordate, amplexicaul.

Garden Lettuce. Salad.

Fr. La Laitue. *Germ.* Der Salat. *Span.* Lechuga.

Plant smooth, mostly yellowish green and glaucous,—sometimes fuscous and tinged with dark purple. *Root* annual. *Stem* 2-4 feet high ; branches clothed with numerous small leaves. *Heads* numerous, terminal, small. Inner *scales* of the *involucres* lanceolate,—the outer or lower ones ovate. *Florets* yellow. *Akenes* lance obovate, striate-ribbed, about half as long as the filiform beak.

Gardens : cultivated. Native country uncertain,—probably India. *Fl.* July. *Fr.* Aug.

Obs. This plant—called salad, *par excellence*—is almost universally known, and cultivated. Those forms known as Curled and Head Salad, formerly considered as distinct species, are now believed to be mere varieties of the above. The milky juice with which the plant abounds at flowering time is very bitter, and possesses narcotic properties ; collected and dried, it forms the Lactucarium of the shops, which is sometimes used as a substitute for Opium. There is a native species (*L. elonga'ta*, *Muhl.*) frequently to be met with, on the farm ; but it is scarcely of sufficient importance to be entitled to notice, here.

33. SON'CHUS, L. SOW-THISTLE.

[Ancient Greek name of obscure meaning.]

Heads many-flowered, tumid at base. *Scales* of involucre more or less imbricated. *Akenes* compressed, ribbed, not beaked ; *pappus* copious, of very white, soft, fine silky hairs, smoothish and glaucous herbs ; *florets* yellow.

1. *S. olera'ceus*, *L.* Leaves runcinate-pinnatifid, dentate, sagittate and clasping ; akenes transversely rugose.

Common Sow-thistle.

Annual. *Stem* 2-3 feet high, branched, hollow, tender, glandular-pilose above. *Leaves* 3-8 inches long,—the lower ones runcinate, on *petioles* 1-2 inches in length,—upper ones clasping. *Heads* of flowers in terminal and axillary cymose panicles ; *peduncles* thickish,

clothed when young with a loose flocculent white tomentum ; *involucre* tumid and orbicular at base, abruptly contracted above to an acumination.

Gardens and cultivated grounds. August - September.

Obs. Besides the above, the Spiny-leaved Sow-thistle (*S. as'per*, *L.*) is frequently met with ; it has prickly toothed leaves, those of the stem clasping it by conspicuous rounded auricles ; and smooth, nerved akenes. A perennial species (*S. arven'sis*, *L.*) with very large flowers, is sparingly introduced along the sea-coast.

ORDER XLI. LOBELIA'CEÆ. (LOBELIA FAMILY.)

Herbs with milky juice, alternate *leaves*, and scattered *flowers* (i. e. not heads). *Calyx-tube* more or less adherent to the ovary. *Corolla* tubular, irregularly 5-lobed, slit longitudinally, nearly or quite to the base on one side. *Stamens* 5, united into a tube by their anthers, and more or less completely by their filaments ; free from the corolla. *Seeds* numerous with fleshy *albumen*. The plants of this family are generally acrid and poisonous.

1. LOBE'LIA, *L.* LOBELIA.

[Named in honor of *Matthias de Lobel*,—a Flemish Botanist.]

Calyx 5-lobed ; the sinuses sometimes with an appendage ; tube short, tumid. *Corolla* tubular,—the tube cylindric or funnel-form, cleft on the upper side nearly to the base ; *limb* somewhat bilabiate,—the upper lip mostly smaller and erect—the lower one broader, spreading, 3-cleft or 3-toothed. *Anthers* coherent in a tube,—the 2 lower ones bearded at apex. *Pod* 2-celled, many-seeded, opening at the top. *Flowers* racemose-spicate, of various colors—usually blue or red.

1. *L. infla'ta*, *L.* Stem erect, hirsute, paniculately branched ; leaves subsessile, lance-ovate, crenate-dentate, pilose ; racemes leafy ; flowers small, axillary ; calyx-tube ovoid, smoothish, the segments as long as the corolla, the sinuses not appendaged ; capsule ovoid or oval, inflated.

INFLATED LOBELIA. Eye-bright. Indian Tobacco.

Root annual or biennial. *Stem* 9 - 18 inches high, sometimes angled or slightly winged by the decurrence of the leaves, often very hairy ; branches axillary. *Leaves* 1 - 3 inches long, more or less ovate, unequally sinuate-dentate or crenate. *Peduncles* one-fourth to half an inch long. *Corolla* pale blue, rather inconspicuous. *Capsule* thin and membranaceous, smoothish. *Seeds* minute, elliptic-oblong, rough with ferruginous reticulated ridges.

Pastures, road-sides, &c. : Canada to South Carolina. *Fl.* July - September. *Fr.* August - October.

Obs. This is an acrid plant,—possessing emetic, cathartic, and narcotic properties ; and is somewhat notorious for the use made of it by a tribe of reckless modern Empirics. It is frequent in our pastures, in the latter part of summer,—and has been suspected of causing the ptyalism or slabbering of horses so often observable at that season. I cannot, however, help doubting the correctness of the opinion ; for the horse is a dainty animal in the selection of his food. I have often remarked the care and dexterity with which he separates the palatable herbage from that which is not so ; and have never seen him eat, nor even crop, so



acrid and offensive a weed as this *Lobelia*. Several other species are common, two of which are admired for the beauty of their blue and red flowers,—particularly the crimson Cardinal-flower, (*L. cardina'lis*, *L.*) ; which is sometimes used by the “Indian doctors” under the name of “*High-belia*,” probably to distinguish it from “*Low-belia*.” It is one of the most showy of our wild flowers, bears transplanting to the garden, and is worthy of being cultivated. A variety is sometimes met with in which the flowers are all white.

ORDER XLII. ERICA'CEÆ. (HEATH FAMILY.)

Shrubs or sometimes *herbs* with mostly alternate *leaves* without *stipules*, and regular or nearly regular *flowers*. *Corolla* 4-5-lobed (rarely 4-5-petalled). *Stamens* as many or

FIG. 141. A branch of Indian Tobacco (*Lobelia inflata*) with fruit and flowers. 142. An enlarged flower showing its corolla split down on one side. 143. The same with calyx and corolla removed, exposing the stamens united by both filaments and anthers.

twice as many as the lobes or petals; *anthers* 2-celled, often with *awn-like appendages*, and frequently opening by *pores* at the summit. *Style* 1. *Ovary* 3-10-celled. *Fruit* a berry or capsule. *Seeds* small, with fleshy *albumen*.

This is an interesting Order,—comprising some plants of a medicinal character, and a number that are exceedingly beautiful—especially the Azaleas, Rhododendrons, Kalmias, and many species of the multitudinous genus (*Erica*) which is the type of the family.

§ 1. HUCKLEBERRY SUB-FAMILY. Calyx-tube adherent to the ovary, which becomes a berry or berry-like fruit. Anther-cells nearly distinct, tapering upwards into a tube.

Ovary 10-celled, with a single ovule in each cell. Berry with 8-10 largish seeds or nutlets.

Ovary 4-5-celled, with several ovules in each cell. Berry many-seeded.

§ 2. HEATH SUB-FAMILY. Calyx free from the ovary. Corolla sometimes of nearly or quite distinct petals. Seed-coat mostly thin and close-fitting.

Fruit a berry or drupe.

Corolla dropping off after blossoming.

Fruit berry-like; the calyx becoming enlarged and fleshy.

Anthers 4-awned at the top.

Fruit a dry pod; the calyx not enlarging.

Corolla ovate or oblong cylindrical, 5-toothed.

Corolla bell-shaped or wheel-shaped, with 10 depressions or pouches.

Corolla of 5 separate petals.

§ 3. PYROLA SUB-FAMILY. Calyx free from the ovary, 5-parted, persistent. Corolla of 5 separate petals. Seeds with a loose transparent and cellular coat.

Flowers in a corymb or umbel. Style very short; stigma broad and orbicular.

1. GAYLUSSACIA.

2. VACCINIUM.

3. ARCTOSTAPHYLOS.

4. GAULTHERIA.

5. ANDROMEDA.

6. KALMIA.

7. CLETHRA.

8. CHIMAPHILA.

1. GAYLUSSACIA, H. B. K. HUCKLEBERRY

[Dedicated to *Gay Lussac*, a distinguished French Chemist.]

Corolla ovoid or bell-shaped; the border 5-cleft. *Stamens* 10; *anthers* awnless; the cells tapering and tubular above, opening by a pore or chink at the summit. *Fruit* a berry-like drupe, containing 10 nutlets. *Leaves* mostly deciduous and entire. Branching shrubs, commonly sprinkled with *resinous dots*, bearing white (purple or red tinged) flowers in bracted racemes.

1. *G. frondo'sa*, Torr. & Gr. Smooth; leaves obovate-oblong, obtuse, glaucous beneath; bracts oblong or linear, deciduous, shorter than the slender drooping pedicels; corolla ovoid campanulate.

LEAFY GAYLUSSACIA. Dangle-berry. Blue Tangles.

Stem 3-5 feet high, branching; branches rather slender. *Leaves* 1-3 inches long, tapering at each end but obtuse at the apex, cuneate at base, on very short petioles. *Racemes* lateral, loose, few-flowered; *pedicels* $\frac{1}{2}$ an inch to an inch long, with two minute subulate sub-opposite bractlets near the middle; *corolla* white tinged with red. *Berries* rather large, globose, dark blue, with a glaucous bloom when mature.

Moist woods and thickets: New England to Kentucky. May-June.

2. *G. resino'sa*, Torr. & Gr. Pubescent while young; leaves oblong oval, at first ciliate and viscid with resinous dots; pedicels short; bracts and bractlets (reddish) small and deciduous; corolla ovoid-conical

RESINOUS GAYLUSSACIA. Black Huckleberry.

Stem 1-3 feet high, much branched. *Leaves* 1-3 inches long, thickly sprinkled with atoms and flat shining patches of yellow resinous matter beneath; *petioles* short but dis-

tinged. *Racemes* numerous, with the flowers crowded; *pedicels* 1–3 lines long, with very small lanceolate bractlets at or near the base; corolla mostly reddish, with tinges of pale yellowish green. *Berries* depressed-globose, black and shining when mature, without any bloom.

Woodlands and swamps: common. May–June.

Obs. The genus *Gaylussacia*, separated from *Vaccinium* on account of its different fruit, contains besides the above-mentioned species two or three others which, as they are not very common, and are not valuable for their fruit, are omitted. Of these the Dwarf Huckleberry, (*G. dumosa*, Torr. & Gr.) which has very conspicuous bracts to the pedicels, and a bristly or glandular ovary becoming a black insipid fruit, is found near the coast from New-England southward. The first of the species here described is readily distinguished by its long, loose racemes. In New-England it is not much valued, but farther south, where it attains greater perfection, the fruit is highly esteemed. *G. resinosa* is the plant which furnishes the larger share of the “black huckleberries” of the northern markets. The fruit presents several varieties, among them one that is nearly white. The flowers of this species as well as the young leaves often become fleshy and expand to many times their natural size; probably from the puncture of some insect. The fruit of both the species described here is known in some parts as “seedy huckleberries.” *

2. VACCINIUM, L. BLUEBERRY. CRANBERRY.

[An ancient classical name; etymology obscure.]

Corolla either bell-shaped, urn-shaped, or cylindrical,—the limb 4–5-cleft, and often reflexed. *Stamens* twice as many as the lobes of the corolla; *anthers* with two tubular horns at summit, and sometimes with two bristle-like awns on the back near the base. *Berry* globose, umbilicate at apex by reason of the persistent calyx-teeth, 4–5-celled,—the cells several-seeded. *Shrubs* with solitary, clustered or racemed flowers; the corolla white or reddish.

♀ 1. *Leaves* evergreen; *corolla* deeply 4-parted: *anthers* 8, awnless, tapering upwards into very long tubes; *pedicels* slender; *berries* acid, red.—CRANBERRY.

1 *V. macrocarpon*, Ait. *Stems* slender, creeping, with ascending branches; *leaves* oblong, obtuse; *peduncles* lateral.

LARGE-FRUITED VACCINIUM. Cranberry.

Stem 1–3 feet long, sending up short slender branches. *Leaves* about $\frac{1}{2}$ an inch long, slightly revolute on the margin, whitish beneath; *petioles* very short. *Peduncles* about an inch long, 1-flowered, *bibracteolate* near the nodding flower. *Corolla* pale purple; *lobes* linear lanceolate, reflexed or revolute. *Berry* globose, $\frac{1}{2}$ an inch or more in diameter.

Peat bogs: common northward. *Fl.* May–June. *Fr.* Oct.

Obs. This species, so highly valued for its fine acid fruit, grows abundantly in the cold bogs of the Northern states; the fruit being collected in large quantities for market, and is even a considerable arti-

cle of export. Of late years, especially in Massachusetts, attention has been given to the culture of the Cranberry, and it is found to be a profitable crop upon lands otherwise of little value. In cultivation it is found to succeed in situations much dryer than those in which it grows in the wild state. Another species, the small cranberry (*V. Oxy-coc'cus*, *L.*), has a much smaller fruit, spotted when young, but is seldom found in great abundance. *

2. *Corolla oblong cylindrical or slightly urn-shaped, 5-toothed; anthers 10, awnless; filaments hairy; berries blue or black with a bloom, sweet.*
BLUEBERRY.

2. *V. Pennsylvan'icum*, *Lam.* Dwarfish; branches yellowish green, somewhat warty; leaves lance-oblong, mucronate-serrulate, smooth and shining; racemes fasciculate.

PENNSYLVANIAN VACCINIUM. Dwarf Blueberry. Sugar Huckleberry.

Stem 6 inches to 2 feet high, much branched; branches more or less angular with a green warty bark. *Leaves* 1 to near 2 inches long, mostly acute at each end, nearly sessile, distinctly serrulate, with bristle-pointed teeth. *Racemes* 4-8-flowered, terminal and lateral, numerous from buds without leaves and often on leafless branches; *pedicels* 1-4 lines long, with small lanceolate bractlets at or near the base; corolla pale red or greenish-white tinged with red. *Berries* abundant, large and sweet.

Hills and woodlands: Pennsylvania, northward. *Fl.* May. *Fr.* July.

Obs. This is the earliest of the Blueberries, ripening its fruit in July; it is found occupying large patches upon poor and otherwise unproductive land. In the state of Maine it is especially abundant, and attains its greatest perfection; we have seen the slender bushes actually prostrate with their load of fruit. Although it is too soft to bear transportation as well as some other kinds, the fruit is the most highly valued by the country people of New England for domestic consumption. *

3. *V. vaccil'lans*, *Solander.* Low, glabrous; branches angular, smooth; leaves obovate or oval, serrulate or entire, smooth on both sides, pale or dull.

Low Blueberry.

Stem 1-2½ feet high; branches greenish sometimes clouded with purplish, very closely set with white dots, sometimes warty. *Leaves* 1 inch to 1½ inch long, rather obscurely serrulate, the serratures more distinct towards the apex. *Racemes* from scaly buds distinct from the leaf-buds; *pedicels* shorter than the flowers; corolla somewhat bell-shaped with spreading segments, yellowish white, often tinged with red. *Berries* large, sweet and covered with a light bluish bloom.

Woodlands: Penn., northward. *Fl.* May. *Fr.* August.

Obs. A much larger plant than the preceding species, and distinguished from it not only by its greater size, but by the dull color of its foliage. The fruit-bearing branches appear above those bearing the leaves, and the bush appears leafless towards the summit. The fruit of this, as well as that of the preceding, is sometimes called "Sugar Huckleberry." *

4. *V. corymbo'sum*, *L.* Tall; young branches pubescent; leaves

ovate, oval, oblong or elliptical-lanceolate, mostly entire ; racemes short, clustered on naked branchlets.

CORYMBOSE VACCINIUM. Swamp Blueberry. Tall Huckleberry.

Stem 5-8 or 10 feet high, often stout, with irregular straggling branches—the young leafing branches pubescent—the flower-bearing ones somewhat angular, naked and inclining to a greenish bronze color. *Leaves* 1-2 inches long, generally elliptic, entire, and always with a short obtuse callous *mucro*, or point, at apex, pubescent when young, especially on the nerves and under surface, finally smoothish ; *petioles* very short. *Racemes* half an inch to an inch long, 6-10 or 12-flowered, proceeding from lateral buds, and unaccompanied with leaves ; *pedicels* 1-fourth to 1-third of an inch long, with purplish *bracts* at base, which resemble bud-scales. *Corolla* white, mostly tinged with purple, nearly cylindrical, somewhat contracted at the orifice, the lobes short and tooth-like. *Berries* rather large, black with a bluish bloom when mature, very agreeable to the taste.

Swamps and moist woods : Canada to Georgia. *Fl.* May. *Fr.* July-August.

Obs. This species presents several varieties, which have been considered by some botanists as species differing chiefly in the pubescence of the leaf. One variety, var. *atrocarpum*, Gray, has the leaves downy, even when old, and produces black berries without any bloom. Other species of *Vaccinium* besides those here enumerated are found in different portions of the country, but these are the most useful kinds, and descriptions of the others must be sought in works of a more extended scope than the present one. *

3. ARCTOSTA'PHYLOS, Adans. BEARBERRY.

[Greek, *Arktos*, a bear, and *Staphyle*, a grape.]

Corolla ovate and urn-shaped, with a short, revolute, 5-toothed limb. *Stamens* 10, included ; *anthers* with two reflexed awns on the back near the apex, opening by terminal pores. *Drupe* berry-like, with 5 seed-like nutlets. *Shrubs* with alternate *leaves* and scaly-bracted nearly white *flowers* in terminal *racemes* or *clusters*. *Fruit* austere.

L. A. Uva-ur'si, Spreng. Procumbent ; leaves obovate or spatulate, entire, thick, smooth, evergreen ; fruit red.

Bearberry. Upland Cranberry. *Uva-ursi*.

Stems branched, trailing on the ground, the sterile branches often 2-3 feet long, the flowering ones shorter. *Leaves* about $\frac{3}{4}$ of an inch long, variable in breadth, spreading or somewhat recurved. *Flowers* drooping ; corolla pale rose color, somewhat transparent at base, hairy inside. *Fruit* about the size of a large pea, containing 5 closely-cohering, almost bony nutlets, surrounded by a mealy pulp.

New Jersey, northward. *Fl.* May. *Fr.* August.

Obs. The Bearberry is common in the Northern States on dry and barren hills, where its prostrate branches form dense mats. The leaves are used in medicine ; they are astringent and tonic, and by some are considered to have an effect upon the



FIG. 144 An enlarged anther of the Bearberry (*Arctostaphylos Uva-ursi*) ; each of the cells prolonged into a tube with an orifice at the top for the escape of the pollen, and furnished with an appendage.

urinary organs ; they are collected in New England for the supply of the drug market. The plant is also found in the Northern portions of the old world, and is used in Iceland to produce a brown or black dye. According to Dr. TORREY, the name *Uva-ursi* is in some places corrupted into "*Universe*." *

4. GAULTHERIA, *Kalm.* CHECKERBERRY.

[Dedicated to *Dr. Gaulthier*, or *Gautier*, a French Botanist, of Quebec.]

Calyx 5-cleft, 2-bracteolate at base. *Corolla* cylindrical-ovoid or a little urn-shaped, 5-toothed. *Stamens* 10, included ; *anther-cells* each 2-awned at summit, opening by a terminal pore. *Capsule* depressed-globose, 5-celled, many-seeded, enclosed by the red berry-like *calyx*. Suffrutescent humble evergreens ; flowers axillary, solitary.

1. *G. procumbens*, *L.* Stem creeping, root-like ; branches ascending, leafy at summit ; leaves cuneate-obovate, obscurely serrate ; flowers few, nodding.

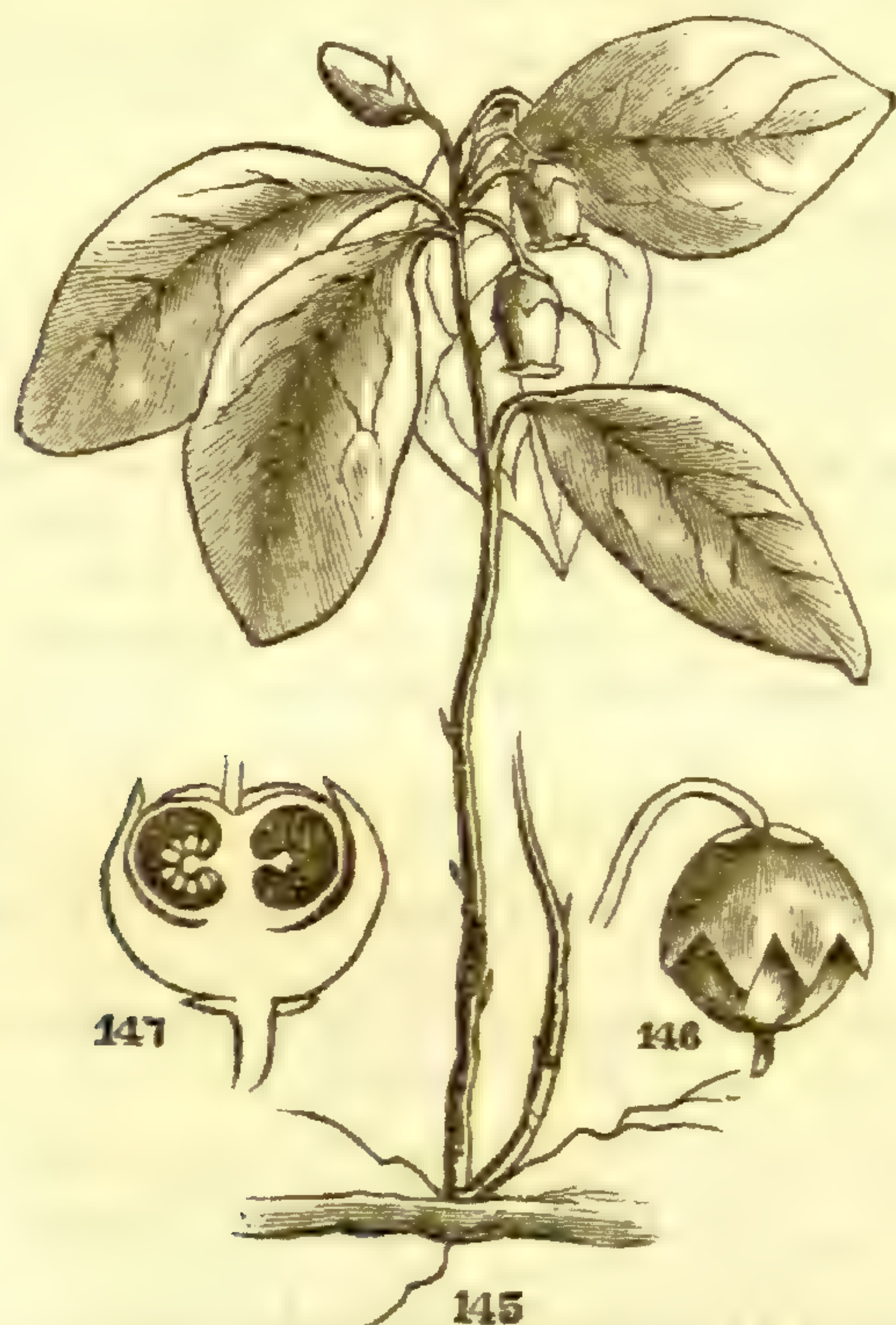


FIG. 145. The Checkerberry (*Gaultheria procumbens*). 146. A partially ripe fruit. 147. A ripe fruit cut open, showing the dry capsule invested with the enlarged fleshy calyx.

PROCUMBENT GAULTHERIA. Tea-berry. Wintergreen. Checkerberry. Boxberry. Ivory Plum. Partridge-berry.

Stem slender, creeping on or near the surface of the ground; *branches* simple, 3–5 inches high, naked below or with a few lance-ovate scales. *Leaves* few (4–6), an inch to an inch and a half in length, rather crowded; *petioles* very short. *Flowers* white, 1–4 in the axils of the upper leaves, on recurved *pedicels* $\frac{1}{4}$ – $\frac{1}{2}$ an inch long; *fruit* persistent.

Canada to the mountains of Carolina. *Fl.* July. *Fr.* Oct.

Obs. The number of popular names which have been given to this little plant, some of which are also bestowed on quite different plants, shows the necessity of a precise botanical nomenclature. The leaves are agreeably aromatic, and yield on distillation a very heavy volatile oil,—the Oil of Wintergreen of the shops,—which is largely used for flavoring confectionery, medicated syrups, &c. The fruit, which has the aromatic property in a much less degree, is pleasant and edible, and is often brought to the markets of our cities. The real nature of the fruit can be readily seen by dividing it lengthwise, when it will be found that the edible portion is the enlarged fleshy calyx, while the proper fruit, *i. e.*, the ripened ovary, is enclosed within it. *

5. ANDROM'EDA, L. ANDROMEDA.

[Named in allusion to the exposure of *Andromeda*; from its place of growth.]

Calyx 5-parted, persistent. *Corolla* hypogynous, tubular, campanulate, or globose,—the limb 5-cleft. *Stamens* 10; *anthers* fixed near the middle, the cells opening by a terminal pore. *Capsule* ovoid or subglobose, 5-celled, many-seeded.

1 A. Maria'na, L. Glabrous; leaves oval, mostly acute at each end, very entire, sub-coriaceous, paler and puncticulate beneath, deciduous; flowering branches nearly leafless; *pedicels* fasciculate, bracteate; *calyx* naked at base; *corolla* ovoid-oblong; *capsule* pyramidal.

MARYLAND ANDROMEDA. Stagger-bush.

Stem 2–3 or 4 feet high, with erect branches. *Leaves* 2–3 inches long; *petioles* about one-fourth of an inch long. *Flowers* in racemose fascicles on the old branches. *Corolla* white, or reddish-white. *Capsule* pentangular-ovoid, truncate at apex. *Seeds* numerous, small, clavate.

Woodlands and sandy plains: New England to Florida. *Fl.* June. *Fr.* August–September.

Obs. This shrub is very abundant in the sandy districts of New Jersey; and the farmers, there, allege that it is injurious to *sheep*, when the leaves are eaten by them,—producing a disease called the staggers. I believe the evidence is not conclusive on this point; but it may be well to know the plant, against which such a charge is made.

6. KAL'MIA, L. AMERICAN LAUREL.

[Dedicated to *Peter Ralm*,—a Swedish Botanist.]

Calyx 5-parted. *Corolla* between wheel-shaped and bell-shaped, 5-lobed, furnished with 10 depressions, in which the 10 obliquely bifid *anthers* are

severally held until they begin to shed their pollen. *Capsule* depressed-globose, 5-celled; *seeds* numerous, minute. Evergreen shrubs; *leaves* entire; *flowers* in umbel-like corymbs.

1. **K. latifo'lia, L.** Leaves mostly alternate, oval-lanceolate, bright green on both sides; corymbs terminal.

BROAD-LEAVED KALMIA. Mountain Laurel. Calico Bush. Spoonwood.

Stem 3-10 feet high, with irregular crooked straggling branches. *Leaves* sometimes in 3's, 2-3 inches long and about an inch wide; *petioles* $\frac{1}{4}$ - $\frac{3}{4}$ of an inch in length. *Flowers* rather large, pale red (sometimes white), in spreading corymbs; *pedicels* about an inch long, viscid pubescent, with 3 bracts at base.

Rocky hills: common. May-June.

Obs. This fine evergreen is common from Maine to the mountains of the Southern States, being conspicuous when in flower, and beautiful on account of its dark green foliage at all times. The wood is very hard, especially that of the root, and is used as a substitute for box by the turners and carvers in the making of small articles. The leaves have the reputation of being poisonous to cattle, but little is positively known of the effects of the plant upon the animal system. It is said to be easy of cultivation in moist soil, but the experiments which have fallen under our observation have not been very successful. *

2. **K. angustifo'lia, L.** Leaves opposite and ternate, narrowly oblong, paler or slightly russet beneath; corymbs lateral.

NARROW-LEAVED LAUREL. Dwarf Laurel. Sheep Laurel. Lambkill.

Stem about 2 feet high, slender, somewhat branching. *Leaves* 1-2 inches long, and about half an inch wide; *petioles* $\frac{1}{3}$ - $\frac{1}{2}$ an inch in length. *Flowers* small, bright crimson, in lateral corymbs in the axils of the ternate leaves and thus appearing verticillate; *pedicels* filiform, $\frac{1}{3}$ - $\frac{2}{3}$ of an inch in length, with 3 unequal bracts at base.

Hill-sides: common. June.

Obs. The leaves of this shrub are supposed to be poisonous to sheep and lambs, hence two of its popular names. The Azaleas, of which there are several native species, and which include some of our most beautiful exotic shrubs, belong here, but our space does not allow us to notice them. The **Azalea nudiflo'ra, L.**, or wild Honeysuckle, has often a singular transformation of its flowers, the parts of the flower becoming enlarged and fleshy and generally consolidated into a shapeless mass. These succulent excrescences are much sought after by boys who call them "swamp apples" and "swamp cheeses"; they at times are somewhat sweetish, but to any but boys, rather poor fruit. **Rhododendron maximum, L.**, the Rose Bay or great laurel, belongs also to this section; it is a noble evergreen shrub, but rather difficult of cultivation, unless sheltered from the powerful heat of our midsummer sun. *

7. CLE'THRA, L. SWEET PEPPER-BUSH.

[*Klethra*, the Greek name for the Alder, which it resembles.]

Calyx of 5 sepals. *Corolla* of 5 obovate-oblong distinct petals. *Stamens* 10, often exserted; *anthers* inversely arrow-shaped, reflexed in the bud, opening by terminal pores or chinks. *Style* slender, 3-cleft at the apex. *Capsule* 3-celled, 3-valved, enclosed by the calyx. *Shrubs* with alternate and deciduous leaves and white flowers in racemes.

1. *C. alnifo'lia*, L. Leaves cuneate-obovate, acute, coarsely serrate, green on both sides; racemes erect, mostly simple, bracteate, hoary-tomentose.

ALDER-LEAVED CLETHRA. White Alder. Sweet Pepper-bush.

Stem 3-10 feet high, branched. *Leaves* 2-3 inches long; *petioles* $\frac{1}{4}$ - $\frac{1}{2}$ an inch in length. *Racemes* 3-6 inches long, sometimes with 2-3 branches from the base, bearing numerous fragrant flowers; *pedicels* short, each with a lance-linear bract at base longer than itself.

Wet thickets: Maine to Virginia. July - Aug.

Obs. This charming shrub, which is not rare in wet places near the coast, deserves to be cultivated in every collection of shrubbery. It is highly prized in England, and were it an imported plant would doubtless be equally valued here. It grows freely in the garden, its spike-like racemes increasing in size by cultivation. The flowers are exceedingly fragrant, indeed oppressively so to some persons. Another species, *A. acumina'ta*, Mx., which is a small tree with drooping racemes, is found in Virginia and southward. *

8. CHIMA'PHILA, Pursh. PIPSISSEWA.

[Greek, *Cheima*, winter, and *Philos*, a lover; from its green appearance in winter.]

Calyx 5-cleft. *Petals* 5, orbicular, spreading, deciduous. *Stamens* 10,—2 in front of each petal; *filaments* dilated and hairy in the middle; *anthers* 2-celled, opening by 2 pores. *Ovary* obtusely conic, or depressed-globose, umbilicate at apex; *style* very short, immersed in the ovary; *stigma* orbicular, peltate. *Capsule* depressed, obtusely pentagonal, 5-celled, 5-valved, loculicidal at base and apex. *Seeds* very minute, reticulate-striate. Humble suffruticose evergreens. *Peduncles* terminal, somewhat corymbose.

1. *C. umbella'ta*, Nutt. Leaves cuneate-oblong, acute at base, serrate, uniform-green; flowers in a terminal subumbellate corymb.

UMBELLATE CHIMAPHILA. Pipsissewa. Winter-green.

Root creeping. *Stem* ascending, 3-6 inches long, leafy at summit. *Leaves* 1-2 inches long, subverticillate (often in 2-3 distinct verticils), coriaceous, glabrous. *Corymb* 4-6-flowered. *Petals* reddish-white.

Hilly woodlands—particularly of northern exposure: Northern and Middle States. *Fl.* June. *Fr.* Sept.

Obs. This half-shrubby little Evergreen possesses some astringency

and bitterness, so as to be moderately tonic,—though doubtless much over-rated in popular estimation. It has been so long and so generally noted, as an Indian medicine, under the name of *Pipsissewa*, that every one who resides in the country ought to be able to identify it.

ORDER XLIII. AQUIFOLIA'CEÆ. (HOLLY FAMILY.)

Trees or shrubs with small axillary 4–5 merous *flowers*, a minute *calyx* free from the 4–6-celled ovary and the 4–6-seeded berry-like *drupe*. *Stamens* as many as the divisions of the almost or quite 4–6-petalled *corolla* and alternate with them, attached to their very base. *Corolla* imbricated in the bud. *Anthers* opening lengthwise. *Stigmas* 4–6, or united into one, nearly sessile; *seed* suspended and solitary in each cell. *Albumen* fleshy. *Leaves* simple, mostly alternate. *Flowers* white or greenish.

1. I'LEX, L. HOLLY.

[The ancient Latin name of the Holly-Oak; applied here.]

Flowers more or less dioeciously polygamous, but many of them perfect. *Calyx* 4–6-toothed. *Petals* 4–6, separate, or only united at the base, oval or obovate, obtuse, spreading. *Stamens* 4–6. The berry-like *drupe* containing 4–8 little *nutlets*. *Leaves* alternate. Fertile flowers inclined to be solitary, and the partly sterile flowers to be clustered in the axils.

♂ 1. *Parts of the flowers commonly in fours, sometimes in fives or sixes, most of them perfect; drupe red, its nutlets ribbed, veiny, or one-grooved on the back; leaves coriaceous and evergreen.* AQUIFOLIUM.

1. *I. opa'ca*, Ait. *Leaves* oval, the margins wavy and sharply spinose-dentate; flowers scattered or loosely fasciculate along the base of the young branches and the axils.

OPAQUE ILEX. American Holly.

Stem 15–40 feet high; *branches* spreading. *Leaves* 2–3 inches long; *petioles* $\frac{1}{4}$ of an inch in length. *Flowers* whitish, ochroleucous, small; *pedicels* with minute bracts at base. Berries small, roundish ovoid, red when mature, persistent.

Woodlands: Maine and southwards. June.

Obs. This becomes a handsome little tree under cultivation; it has less glossy foliage than the European Holly (*I. aquifolium*), which is in Europe considered to make the most durable hedge of any plant whatever. Our own species might be advantageously used for hedges where the slow growth is not an objection. The seeds do not germinate until the second year after planting. The bright berries of the Holly, and its dark foliage, make it one of the most desirable evergreens for those who decorate their homes on Christmas. The wood is very compact and of fine texture, and is employed in the manufacture of whip handles, screws, and other small articles. The tree attains a much larger size in the Southern States than it does at the North. Doct. TORREY informs us that there were some years ago, at the Highlands of Neversink, New Jersey, several trees of unusual dimensions, some of them being as large round as a man's body. The celebrated Paraguay Tea, or "Mate," which is a substitute for both tea and coffee to a large proportion of the

inhabitants of South America, belongs to this genus. One of our own southern species, *I. Cassi'ne*, L., known as Yaupon, furnished the black drink of the North Carolina Indians. *

§ 2. *Parts of the sterile flowers in fours, fives, or sixes; those of the fertile flowers commonly in sixes (rarely in fives, sevens or eights); nutlets smooth and even. Shrubs. PRINOS.*

2. *I. verticilla'ta*, Gray. Leaves obovate, oval or wedge-lanceolate, pointed, acute at the base, serrate, downy on the veins beneath; flowers all very short-peduncled; berries red.

VERTICILLATE ILEX. Black Alder. Winter-berry.

Stem 6–8 feet high, much branched. *Leaves* 2–3 inches long; *petioles* about half an inch in length. *Flowers* greenish white, in sessile clusters or solitary. *Berries* about $\frac{1}{4}$ of an inch in diameter.

Low grounds: common especially northward. June.

Obs. The bark and berries of this species have some medicinal reputation as a cure for ill-conditioned sores—used both externally and internally. Another nearly related species, *I. læviga'ta*, Gray, found in wet swamps, has the leaves mostly smooth beneath, the sterile flowers long-peduncled, and larger berries than the preceding. Both are sometimes seen cultivated among shrubbery, their red berries rendering them very showy in autumn. *I. gla'bra*, Gray, the Ink-berry, has evergreen, narrow leaves, and black berries. It is mostly found near the coast, and is much sought after by the flower-merchants of our large cities, as it is one of the most suitable evergreens to work into bouquets. *

ORDER XLIV. EBENA'CEÆ. (EBONY FAMILY.)

Trees or shrubs, destitute of milky juice, the wood often black. *Leaves* alternate and entire, without stipules. *Flowers* often polygamous. *Calyx* free from the ovary. *Stamens* twice to four times as many as the lobes of the corolla. *Ovary* 3–several-celled. *Fruit* baccate. *Seeds* pendulous, bony, with cartilaginous albumen.

A small Order, and the genus here given is the only one of any considerable importance,—some of the species of which furnish the well-known hard black wood called *Ebony*.

1. DIOSPY'ROS, L. PERSIMMON.

[Greek, *Dis*, *Dios*, Jupiter, and *Pyros*, fruit; a rather fanciful name for such fruit.]

DIOECIOUSLY POLYGAMOUS: *calyx* 4–6-parted. *Corolla* tubular, somewhat urceolate, 4–6-cleft. STERILE FL. *Stamens* twice or many times (usually 4 times) as numerous as the lobes of the corolla; *anthers* linear-lanceolate. *Ovary* abortive. FERTILE FL. *Stamens* 8–16, mostly abortive. *Ovary* 4–8-celled; *styles* 2, 4, or several, more or less connate at base. *Berry* ovoid or subglobose, with the persistent calyx often adhering to the base, 8–12-seeded. *Seeds* oblong, compressed. *Trees*, or rarely *shrubs*. *Flowers* axillary, subsessile—the fertile ones solitary, the sterile ones mostly in threes.

1. *D. VIRGINIA'NA*, *L.* Leaves elliptical or ovate-oblong, obtusely acuminate; parts of the flower chiefly in fours; corolla subcoriaceous.

VIRGINIAN DIOSPYROS. Persimmon. Date Plum.

Fr. Le Plaqueminier. *Germ.* Der Pseudo-Lotus.

Stem 20 – 50 or 60 feet high, and 10 – 15 or 20 inches in diameter, irregularly branched. *Leaves* 2 – 3 or 5 inches long, subcoriaceous, green above, paler or somewhat glaucous beneath; *petioles* half an inch to near an inch long. *Calyx* of the fertile flower spreading and persistent at the base of the fruit. *Corolla* ochroleucous or pale greenish-yellow, of a thick leathery texture. *Berry* about an inch in diameter, reddish-orange color when mature, soft and pulpy after frost. *Seeds* large, flattish.

Rich bottom-lands, along streams: Middle and Southern States. *Fl.* June. *Fr.* Oct. – November.

Obs. The ripe fruit of this tree is sweet and luscious, after being subjected to the action of frost; but is remarkably harsh and astringent in a green state. The bark is astringent and tonic. The *Styrax* Family (*Styra'ceæ*), is nearly related to the *Ebenaceæ*. It has perfect and regular flowers, with the ovary more or less adherent to the calyx. Several species of *Styrax* belong to the Southern States. The *Hale'sia*, or Silver Bell, two species of which, one with 2-winged and the other with 4-winged fruit, are common in cultivation, and belong to this order; as does the *Symplocos* (*Hopea*) *tincto'ria*, the "Horse Sugar" of the South, the green sweet leaves of which being a favorite food of cattle.

ORDER XLV. PLANTAGINA'CEÆ. (PLANTAIN FAMILY.)

Chiefly low, apparently stemless, perennial *herbs*, with radical, rosulate, strongly ribbed *leaves* and small spicate *flowers* on scapes. *Corolla* membranaceous and persistent. *Stamens* inserted on the tube of the corolla alternately with the lobes. *Ovary* 2-celled; *style* single. *Capsule* membranaceous, circumscissid; *cells* 1 – several-seeded.

An Order consisting chiefly of the genus whose name it bears, and the species here described are those of chief interest to the agriculturist.

1. PLANTA'GO, *L.* PLANTAIN.

[The ancient Latin name of the Plantain; meaning obscure.]

Calyx of 4 imbricated persistent *sepals*, with dry membranaceous margins. *Corolla* salver-form, the border 4-parted, withering on the pod. *Stamens* 4, much exserted. *Flowers* whitish, small, bracted.

* *Pod* 7 – 16-seeded.

1. *P. ma'jor*, *L.* Leaves ovate or oval, smoothish, obscurely dentate, on long *petioles*; scape terete, smooth; spike nearly cylindrical, rather slender and very long; flowers somewhat imbricated; capsule about 6-seeded.

GREATER PLANTAGO. Common Plantain. Way-bread.

Fr. Plantain ordinaire. *Germ.* Der grosse Wegetritt. *Span.* Llanten.

Root perennial. *Leaves* 3 – 6 or 8 inches long, strongly 5 – 7-nerved with an elastic filament in each nerve, generally smoothish (sometimes quite pilose), abruptly contracted at base to a channeled *petiole* about as long as the leaf. *Scapes* several, 6 – 18 inches high



(including the *spike* of flowers, which varies from 2–12 or 15 inches in length). *Bracteoles* lanceolate, keeled, appressed, shorter than the calyx. *Corolla* whitish, inconspicuous, ventricose below, contracted into a neck above, shrivelling and persistent. *Stamens* about twice as long as the corolla.

Moist rich grounds, along foot-paths, &c.; throughout the United States: introduced. Native of Europe and Japan. *Fl.* June–September. *Fr.* August–October.

Obs. This foreigner is very generally naturalized; and is remarkable for accompanying civilized man—growing along his footpaths, and flourishing around his settlements. It is said our Aborigines call it “the white man’s foot,” from this circumstance. Perhaps the generic name (*Plantago*) may be expressive of a similar idea—viz., *Planta*, the

FIG. 148. Common Plantain (*Plantago major*), reduced.

sole of the foot, and *ago*, to act, or exercise. It is rather a worthless weed, but is not much inclined to spread, or be troublesome, on farm lands. The leaves are a convenient and popular dressing for blisters, and other sores; a fact which seems to have been known in the time of SHAKSPEARE—as we may learn from his *Romeo and Juliet*, Act I, Sc. 2.

“*Rom.* Your *Plantain leaf* is excellent for that.

“*Ben.* For what, I pray thee?

“*Rom.* For your *broken shin.*”

**** Pod 2-seeded.**

2. *P. lanceola'ta*, L. Leaves lanceolate, acute at each end; scape sulcate-angled, long and slender; spike ovoid-cylindric, short; calyx deeply 3-parted; capsule 2-seeded.

LANCEOLATE PLANTAGO. Ribgrass. English Plantain. Buckhorn Plantain.

Root perennial. *Leaves* 4–8 or 10 inches long, hairy, narrowed gradually at base to a *petiole* 2–5 or 6 inches in length. *Scapes* several, 1–2 feet high, somewhat pilose with appressed hairs. *Spike* 1–2 inches long, at first ovoid-oblong, finally nearly cylindric, dense-flowered. *Bracteoles* ovate, acuminate, scarious on the margins and at apex—the slender point at length reflexed. *Calyx* deeply 3-parted (or rather of 3 sepals), the outer or lower segment or sepal oval, truncate, emarginate, with 2 green keel-like lines—the lateral segments or sepals rather longer, boat-shaped, acute, keel green, fringed with hairs near the apex. *Corolla* dirty white. *Stamens* several times longer than the corolla; *anthers* greenish-white. *Seeds* oblong, convex on one side concave on the other, shining, brown or amber-colored.

Pastures and upland meadows: introduced. Native of Europe. *Fl.* May–August. *Fr.* July–September.

Obs. This species, also, is extensively naturalized, and is particularly abundant in upland meadows, or clover grounds. The seeds being nearly the same size and weight as those of the red clover, they cannot readily be separated—and thus the two plants are disseminated together, in the culture of clover. Nearly all kinds of stock eat this Plantain freely, and it has even been cultivated expressly for a Sheep-pasture; but it is generally much disliked, in Pennsylvania. I do not, however, perceive any mode of getting rid of it, or even of arresting its progress, unless it can be choked down by heavy crops of Clover and the valuable Grasses.

ORDER XLVI. BIGNONIA'CEÆ. (BIGNONIA FAMILY.)

Woody or sometimes *herbaceous* plants, with mostly opposite, simple or compound *leaves*, and didynamous or diandrous *flowers*. *Calyx* 2-lipped or 5-cleft; *corolla* tubular or bell-shaped, 5-lobed, somewhat irregular and 2-lipped, deciduous; *ovary* free, 2-celled by the projection of the placenta; *capsule* coriaceous or woody, 2-valved, many-seeded; *seeds* large, flat, often winged, destitute of albumen.

SUB-ORDER 1. BIGNONEÆ.

Woody plants with 1–2-celled and 2-valved *Pods*. *Seeds* flat and winged.

1. TE'COMA, Juss. TRUMPET-FLOWER.

[Name abridged from the Mexican.]

Calyx bell shaped, 5-toothed. *Corolla* funnel-form 5-lobed, a little irre-

gular. *Stamens* 4. *Pod* long and narrow, 2-celled, the partition contrary to the convex valves. *Seeds* transversely winged. Woody vines with compound leaves.

1. *T. radicans*, Juss. Leaves pinnate; leaflets 5–11, ovate, pointed, toothed; flowers corymbed.

ROOTING BIGNONIA. Trumpet creeper.

Stem climbing by rootlets. *Leaflets* about 4 inches long, tapering into a *petiole* which is often bordered on one or both sides by the decurrent luminar, ribbed, smooth on the upper surface, pubescent along the ribs below. *Flowers* corymbed on pedicels about half an inch long. *Corolla* tubular, funnel-shaped, somewhat ventricose below, about 3 inches in length. Orange and scarlet, very showy. *Stamens* included. *Pod* very long, terete.

Pennsylvania, Illinois and southward. June–September.

Obs. This beautiful climber, which is cultivated extensively, and readily bears

the climate of New England, is, according to Dr. SHORT, a great pest along the Ohio River, where it is much disposed to overrun wet places on high lands.



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2. CATAL'PA, Scop. CATALPA.

[A name said to be derived from our Southern Indians.]

Calyx bilabiate 2-lobed. *Corolla* campanulate—the tube ventricose, the limb unequally 5-lobed, sub-bilabiate. *Stamens* 2 fertile and 3 sterile

FIG. 149. A flourishing branch of the Trumpet Creeper (*Tecoma radicans*), reduced.

or abortive (rarely didynamous). *Capsule* silique-form, cylindric, long, 2-valved; *septum* thickish, opposite the valves. *Seeds* numerous, transverse, compressed, produced at each end into a membranous wing, which is fringed or comose at apex. *Trees*. *Flowers* in terminal panicles.

1. *C. bignonioides*, Walt. Leaves cordate, acuminate, entire, pubescent beneath; panicles pyramidal, trichotomously branched.

BIGNONIA-LIKE CATALPA. Catawba. Bean-tree.

Stem 15–25 feet high, with irregular spreading branches. *Leaves* 4–8 or 10 inches in length; *petioles* 2–6 inches long, terete, smoothish. *Corolla* whitish, tinged with violet-purple, the throat spotted with purple and yellow, the lobes unequal, crenate and wavy. *Capsule* 6–12 or 15 inches long, and about half an inch in diameter, pendulous, persistent. *Seeds* lance-oblong, about half an inch in length, apparently of 2 flat oval divaricate lobes, connate at base, with a membranous covering which is extended at the margin, and especially at the apex, each apex terminating in a slender filamentous tuft or coma.

About farm-houses and along streams: Southern, Western and Middle States. *Fl.* June–July. *Fr.* October.

Obs. Cultivated as a shade tree, but indigenous in the South-west. In the latitude of New York the larger branches, and frequently the whole tree, are killed by a severe winter.

SUB-ORDER 2. SESAMEÆ.

Herbs with the fruit more or less 5-celled. *Seeds* not winged.

3. MARTY'NIA, L. UNICORN-PLANT.

[Named in honor of *John Martyn*, Prof. of Botany at Cambridge, England.]

Calyx 5-cleft, with 2–3 small bracts at base. *Corolla* irregular, campanulate, gibbous at base,—the limb unequally 5-lobed. *Stamens* mostly 4, didynamous, with a fifth rudimentary one,—sometimes all, sometimes 2 only, bearing anthers. *Capsule* somewhat 4-celled, 2-valved, woody with a coriaceous and finally deciduous coat, ovoid-oblong, terminating in a curved beak at apex,—the beak parting into 2 horns, but the capsule scarcely dehiscent. *Seeds* few in each cell, arranged in a single series along the septum, somewhat baccate, finally tuberculate-rugose.

1. *M. probosci'dea*, Glox. Stem branching; leaves orbicular-cordate entire, petiolate,—the upper ones alternate; beaks longer than the pericarp.

LONG-BEAKED MARTYNIA. Unicorn Plant.

Plant pale green, viscid-pubescent and fetid. *Root* annual. *Stem* leaning or procumbent, 1–2 feet long, branching, fistular. *Leaves* 2–5 inches long; *petioles* 2–6 inches long. *Flowers* axillary; *peduncles* 1–3 inches long. *Corolla* large, pale greenish yellow or ochroleucous, with orange-colored or brownish spots within. *Capsule* 2–3 inches long, somewhat sulcate in front, with a bipartite crest-like fringe along the suture in the broad shallow groove, tapering to a beak which is 2–3 or 4 inches long, and finally split into two rigid horns, which are incurved like claws.

South-western States: gardens: cultivated. *Fl.* July–August. *Fr.* Sept.–October.

Obs. This plant—a native of the valley of the Mississippi, and the plains of Mexico—is cultivated for its singular fruit—which, in its

young state—before it becomes hard and woody—is used for making pickles.

4. SE'SAMUM, L. BENNE.

Calyx 5-parted, the upper lobe smallest. Tube of *corolla* large, limb plicate somewhat bilabiate; upper lobe emarginate, lower slightly 3-fid. *Stamens* 4, didynamous, with the rudiment of a fifth. *Capsule* oblong, obtusely 4-angled, 4-grooved, 2-celled, 2-valved, valves recurved. *Seeds* numerous. *Annual herbs* with the upper leaves often alternate-solitary and axillary flowers and oily seeds.

1. *S. IN'DICUM*, DC. Stem erect pubescent; leaves ovate-oblong or lanceolate, the lower often 3-lobed; capsule mucronate with the persistent style, velvety pubescent.

INDIAN SESAMUM. Benne. Sesame.

Stem 4–5 feet high, branching. *Leaves* petioled, very variable in shape, those near the base of the stem often 3-fid. *Flowers* on short peduncles, reddish white. *Pods* about an inch and a half long, filled with seeds which are white, or in some varieties black on the margin.

Native of India, cultivated.

Obs. The Benne plant being a native of India, does not perfect its seeds in the northern States, but only succeeds in those climates in which the cotton plant can be cultivated. It is said that the plant was introduced by the negroes, who make use of the seeds as food. The seeds contain a large quantity of oil, which is obtained by expression in the same manner as Linseed oil; it is bland and tasteless, and is used for the same purposes as Olive oil, answering for cooking or for burning. The plant is cultivated in many warm countries for the sake of the oil. The leaves abound in mucilage which they readily impart to water; one or two of them stirred in a half-pint of water will render it thick and ropy without affecting its transparency. The plant is often raised at the north, from seeds brought from the south, for the leaves, the mucilaginous drink made from them being considered serviceable in the bowel complaints of children, though it probably possesses no advantage over that made from the bark of the Slippery Elm, or the Sassafras Pith. *

ORDER XLVII. SCROPHULARIA'CEÆ. (FIGWORT FAMILY.)

Herbs, shrubs or sometimes even *trees* with alternate, opposite or verticillate *leaves* without stipules, a persistent *calyx* of 4–5 more or less united sepals, and a more or less irregular, bilabiate or personate *corolla*, with the lobes imbricated in the bud. *Stamens* either 4 and didynamous—the fifth stamen sometimes appearing in the form of a sterile filament, or very rarely antheriferous,—or often only 2—one pair being either suppressed or reduced to sterile filaments. *Ovary* 2-celled, with the placentæ united in the axis. *Capsule* 2-valved. *Seeds* indefinite, albuminous.

An Order of nearly 150 genera,—affording many curious and rather handsome flowers—some troublesome weeds—and a few plants of considerable medicinal powers—especially the purple Fox-glove (*Digitalis purpurea*, L.).

§ 1. Upper lip of the corolla covering the lower in the bud.

Corolla wheel-shaped 5-cleft, the lobes somewhat unequal. *Stamens* 5; a part or all of the filaments bearded.

1. VERBASCUM.

Corolla tubular with a spur at the base. Pod opening by holes.
 Corolla tubular, not spurred. Calyx lobes thick and leathery.
 Stamens 4. Trees.
 § 2. Lower lip or the lateral lobes covering the upper lip in the bud.
 Corolla tubular, open; the border slightly 5-lobed. Flowers in a
 long raceme.
 Corolla wheel-shaped, 4 parted. Stamens 2.

2. LINARIA.
3. PAULOWNIA.
4. DIGITALIS.
5. VERONICA.

1. VERBAS'CUM, L. MULLEIN.

[Quasi *Barbascum*; Latin *Barba*, beard; from its bearded or woolly habit.]

Calyx 5-parted. *Corolla* with a very short tube; limb sub-rotate, 5-lobed—the lobes nearly equal or the front one larger. *Stamens* 5, unequal, inserted on the tube of the corolla, declinate, exserted,—the *filaments* (or some of them) bearded. *Capsule* ovoid or globose. *Seeds* numerous, rugose-pitted. Tall and usually woolly biennial *herbs*, with alternate *leaves*, those of the stem sessile or decurrent. *Flowers* in dense spikes, or paniculate racemes.

1. *V. Thap'sus*, L. Stem simple, erect, tomentose; leaves oval-lanceolate or oblong, very woolly on both sides,—the cauline ones decurrent; flowers in a dense terminal spike; 2 lower filaments smooth.

THAPSUS VERBASCUM. Mullein. Common Mullein.

Fr. Bouillon blanc. Germ. Das Wollkraut. Span. Gordolobo.

Whole plant pale greyish-green or hoary tomentose,—the pubescence much branched. Stem 3–6 feet high, rather stout, leafy, rarely branching unless injured. Radical leaves 6–12 inches long,—the cauline ones smaller. Spike cylindric, 6–12 or 15 inches long; flowers bracteate. Corolla bright yellow. Stamens unequal,—the two lower ones longer, with smooth filaments.

Neglected fields; road-sides, &c.: introduced. Native of Europe. Fl. June–July. Fr. August–September.

Obs. This plant, although abundant in all the older settlements, is undoubtedly a naturalized foreigner. It is a worthless, unseemly intruder, in our pastures and cultivated grounds. There is no surer evidence of a slovenly, negligent farmer, than to see his fields over-run with Mulleins. As the plant produces a vast number of seeds, it can only be kept in subjection by a careful eradication while young—or at least before the fruit is mature. When neglected, the soil soon becomes so full of seeds, that the young plants will be found springing up, in great numbers, for a long succession of years.

2. *V. Blatta'ria*, L. Smoothish and green; stem rather slender, often branched; leaves oblong, serrate, not decurrent; flowers racemose; filaments all hairy.

MOTH VERBASCUM. Moth Mullein.

Stem 2–4 feet high, angular. Leaves 2–5 inches long,—the lower ones petiolate, often sinuate pinnatifid, the upper ones sessile and clasping. Raceme 6–18 inches long, leafy or bracteate, glan-lular pubescent; pedicels $\frac{1}{2}$ an inch to an inch in length; flowers either bright yellow or white with a tinge of purple.

Pastures and road-sides. Native of Europe. June–August.

Obs. A common weed, though not so much of a nuisance as the preceding. Besides the two species described above, a third, *V. Lychni'tis*, L., or White Mullein, is found in some localities. It is a tall plant with

a thin, powdery woolliness and yellow (sometimes white) flowers, in a pyramidal panicle. It is said to hybridize or cross-breed with the common Mullein, thus producing some remarkable varieties.

2. LINA'RIA, *Tournef.* TOAD-FLAX.

[Latin, *Linum*, flax ; from the resemblance of the leaves.]

Calyx 5-parted. *Corolla* with the limb personate, the upper lip bifid with the lobes folded back—the lower lip trifid, closing the throat by its prominent palate ; tube inflated, spurred at base. *Stamens* 4, didynamous,—usually with a minute abortive rudiment of a fifth. *Capsule* ovoid or globose, membranaceous, 2-celled, opening below the summit by 1–2 pores or chinks, toothed. *Seeds* numerous, margined. Mostly *herbs*, annual or perennial. *Leaves* alternate, rarely opposite or verticillate. *Flowers* usually racemose.

1. *L. vulga'ris*, *Mill.* Stem erect, simple ; leaves lance-linear, acute, alternate, numerous ; flowers imbricated, in a terminal raceme ; spur of the corolla acute, about as long as the tube.

COMMON LINARIA. Toad-flax. Ranstead-weed. Butter and Eggs.

Fr. Muflier linaire. *Germ.* Das Flachskraut. *Span.* Linaria.

Plant smooth and somewhat glaucous. *Root* perennial, creeping, subligneous. *Stem* 1–2 or 3 feet high, slender, terete, leafy, sometimes branched at summit and bearing several racemes, generally growing in bunches or small patches. *Leaves* 1–2 inches long, narrow, irregularly scattered on the stem, but very numerous. *Flowers* pedunculate, in a dense bracteate raceme—the peduncles shorter than the bracts. *Corolla* pale greenish-yellow, smooth,—the palate of the lower lip bright orange color, villous in the throat ; spur subulate, about half an inch long. *Style* shorter than the longest stamens ; *stigma* obliquely truncate. *Capsule* ovoid oblong, thin, smooth, longer than the calyx. *Seeds* with a dilated orbicular margin, roughish-dotted in the centre.

Pastures, fence-rows, &c.: introduced. Native of Europe. *Fl.* June–September. *Fr.* August–October.

Obs. This is extensively naturalized,—and has become a vile nuisance in our pastures and upland meadows. Mr. WATSON, in his annals of Philadelphia, says it was introduced from Wales, as a garden flower, by a Mr. RANSTEAD, a Welsh resident of that city ; and hence one of its common names. It inclines to form large patches, by means of its creeping roots,—and as far as it extends, takes almost exclusive pos-



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FIG. 150. Toad-flax (*Linaria vulgaris*).

session of the soil. Although the flowers are somewhat showy, it is a fetid, worthless and very objectionable weed,—the roots very tenacious of life—and requiring much persevering effort to extirpate them. The remarkable variety called *Peloria*—with a regular 5-lobed ventricose corolla, 5 spurs, and 5 perfect stamens—is occasionally to be observed. Sometimes these *Pelorias* are tetramerous; *i. e.* the corolla 4-lobed, with 4 spurs, &c. They are frequently, if not always, late flowers,—situated at the summit of the raceme of full grown capsules, and apparently the latest floral developments of the plant. Two other European species are sparingly introduced, but they are fortunately not sufficiently disseminated to warrant their description here.

3. PAULOW'NIA, *Sieb. & Zucc.* PAULOWNIA.

Calyx deeply 5-cleft, divisions thick. *Corolla* with an elongated declined tube and an oblique limb with 5 roundish divisions. *Stamens* 4, ascending from a declined base, without the rudiment of a fifth. *Capsule* woody, acuminate, loculicidally 2-valved. *Seeds* numerous, oblong, surrounded by a membranaceous wing, striate.—*Trees* with the habit of *Catalpa*; natives of Japan.

1. *P. IMPERIA' LIS*, *Sieb & Zucc.* Leaves opposite, petioled, somewhat 3-lobed or entire, broadly ovate cordate: panicle terminal large with many-flowered opposite branches.

IMPERIAL PAULOWNIA. Paulownia.

Tree with horizontal tortuous branches. *Leaves* when young canescent hairy on both sides, when old on the under side only, with the upper surface finely pubescent, six inches to a foot in length, and on the young shoots even larger. *Calyx* divided below the middle, the lobes oblong obtuse, externally tomentose. *Corolla* $1\frac{1}{2}$ –2 inches long, violet or rose color, dotted and streaked with brown and yellow within. *Capsule* an inch in length, 2-furrowed, persistent.

Cultivated. *Fl.* April–May.

Obs. A tree of very rapid growth and having a strong resemblance to the *Catalpa*. The young trees are remarkably vigorous and bear leaves of an enormous size. It is a little too delicate for the climate of New York, for three years preceding the present (1858) the flower buds have been very generally killed by the severe winters. The capsules remain on the tree for a very long time and injure its appearance. *

4. DIGITA' LIS, *L.* FOXGLOVE.

[From the Latin, *Digitale*, the finger of a glove; from the shape of the flowers.]

Calyx 5-parted. *Corolla* declined, tube ventricose above, contracted at base, the limb oblique, upper lip emarginate, the lower 3-fid with the middle lobe the largest. *Stamens* 4, didynamous. *Capsule* ovate, with a septicidal dehiscence. *Seeds* numerous, minute, oblong, angled. *Herbs* with crowded, petioled, radical leaves; bearing showy flowers in a long raceme.

1. *D. PURPU' REA*, *L.* Biennial; lower leaves ovate or elliptic-oblong,

crenate, downy, on winged petioles, those of the stem alternate, somewhat decurrent; raceme erect, one-sided, simple, of numerous drooping crimson or purplish flowers.

PURPLE DIGITALIS. Fox-glove.

Stem 3-4 feet high, angled, leafy below and terminated by the raceme. *Leaves* dull green, prominently netted-veined; those of the stem gradually diminishing into bracts. *Flowers* 2-2½ inches long, within somewhat hairy and beautifully spotted with deep purple dots surrounded by white rings, or nodding, solitary, axillary peduncles. *Capsule* downy, tipped with the persistent *style*. *Seeds* pale brown, pitted.

Cultivated. Native of Europe. June-July.

Obs. Common in gardens where it is prized for its showy flowers, and cultivated by the "Shakers" and others who raise medicinal plants for its leaves. The common name Fox-glove is said to be a corruption of the old Saxon name Folk's glove. Medicinally Fox-glove is classed with Tobacco, Lobelia and other acrid narcotics, and should only be employed under the direction of a medical adviser as it is dangerous in large doses. Though considerable quantities of the leaves are supplied to the drug market by the "physic gardens" of this country, they are considered greatly inferior to those produced by the plant growing in its native localities. *

5. VERO'NICA, L. SPEEDWELL.

[Origin of the name obscure; perhaps the flower of St. Veronica.]

Calyx 4-parted. *Corolla* wheel-shaped or salver-shaped, the border unequally 4-lobed, the lateral lobes, or the lower one, usually narrower. *Stamens* 2, one on each side of the upper lobe of the corolla, exserted; *anther-cells* confluent at the apex. *Capsule* ovoid or obcordate and compressed at the apex, 2-celled, few-many-seeded.

1. V. peregrina, L. Annual; smooth; lower leaves opposite petioled, toothed, the upper alternate, sessile and entire; flowers subsessile in the axils of leaf-like bracts; capsule orbicular, slightly notched.

FOREIGN VERONICA. Purslane Speedwell. Neckweed.

Stem 3-6 inches high, often branched at base. *Leaves* half an inch to near an inch long, fleshy. *Calyx lobes* resembling the small upper leaves or bracts. *Corolla* whitish, small and soon falling, the lobes nearly equal.

Waste and cultivated grounds. April-June.

Obs. A very common annual weed which has every appearance of an introduced stranger, though it is considered by most botanists as a native plant. It is widely different throughout the whole length of our continent. It was at one time supposed to possess medicinal virtues in scrofulous affections,—which acquired for it the name of "Neckweed." There are a number of native and introduced species belonging to this genus, but this is the only one sufficiently common, as a weed, to be noticed.

ORDER XLVIII. VEBBENA'CEÆ. (VERVAIN FAMILY.)

Herbs (shrubs, and even trees within the tropics), having opposite leaves without stipules, and a tubular corolla with the limb 4-5-lobed, more or less 2-lipped and didynamous stamens. *Ovary* free, entire, 2-4 celled. *Fruit* dry (or sometimes drupaceous), and splitting into 2-4 indehiscent 1-seeded nutlets. *Seeds* with little or no albumen.

An Order of but little importance to the farmer,—though containing a number of plants interesting to the florist. The tree which furnishes the “ever-during Teak” of India (*Tectona grandis*, L.)—so celebrated in ship-building—belongs to this Order.

1. VERBE'NA, L. Vervain.

[The Latin name for the leaves of any sacred herb ; etymology obscure.]

Calyx tubular, 5-toothed,—one of the teeth often shorter. *Corolla* tubular, somewhat salver-form, with the limb rather unequally 5-lobed. *Stamens* included, the upper pair usually without anthers. *Ovary* 2-4-celled, with 1 ovule in each cell. *Fruit* separable into 2-4 nutlets. *Flowers* mostly in terminal spikes, bracteate.

1. *V. urticæfo'lia*, L. Leaves ovate and lance-ovate, acute, serrate, petiolate ; spikes filiform, terminal and axillary, somewhat paniculate ; flowers distant.

NETTLE-LEAVED VERBENA. Common Vervain.

Root perennial. *Stem* erect, 2-3 or 4 feet high, obtusely quadrangular, hirsutely pubescent, with slender axillary spreading branches above. *Leaves* 2-4 inches long, abruptly narrowed at base to a short petiole. *Spikes* 1 or 2-5 or 6 inches long, green, very slender. *Flowers* distinct and finally a little distant, small, sessile, with a minute bract at base. *Corolla* white,—the throat closed by a delicate white villus. *Fruit* separating into 4 nutlets, which are oblong and triquetrous, with the outer side convex.

Pastures, road-sides, &c. : throughout the United States. *Fl.* July-August. *Fr.* September.

Obs. This is not a very pernicious or troublesome weed ; but as it is altogether worthless, and often so abundant in pasture fields as necessarily to attract the notice of the observing farmer, I thought it might be admitted into the present work.

V. officina'lis, another introduced species with pinnatifid or 3-cleft leaves and small purplish flowers is found in some localities. The species of this genus are remarkable for their tendency to hybridize ; several of our native species produce hybrids spontaneously. Various crosses and varieties of *V. auble'tia*, *V. chamædrifo'lia*, and other species, are now among the most common and deservedly popular ornaments of the flower garden. The varieties are almost innumerable and are yearly increased by the florists.

ORDER XLIX. LABIA'TÆ. (MINT FAMILY.)

Chiefly *herbs* with quadrangular stems, opposite or sometimes verticillate leaves without stipules, and flowers in axillary opposite cymes or aggregated in terminal spikes, rarely solitary. *Corolla* more or less bilabiate. *Stamens* 4, didynamous, or sometimes 2 ; anther-cells parallel, or often divaricate,—sometimes separated by a long filiform connective. *Ovary* deeply 4-lobed, becoming, in fruit, 4 little seed-like nutlets, surrounding the base of the style, in the bottom of the persistent calyx ; each lobe, or nutlet, containing a single seed with little or no albumen. Foliage containing receptacles of aromatic oil.

A highly interesting and valuable Order, containing upwards of 100 genera, and particularly remarkable for the aromatic fragrance, and stomachic properties, of many of the species. The most important, however,—being generally cultivated,—are here inserted.

* Stamens 4, the lower pair longer, declined so as to rest on the lower lip of the corolla. Flowers in racemes, white; upper lobe of calyx broad, orbicular-ovate. Leaves ovate.

Flowers in terminal peduncled spikes, pale blue; calyx 5-toothed; leaves narrow, hoary.

** Stamens 4 or 2, not turned down.

Corolla almost equally 4-lobed. Stamens 4, nearly equal.

Corolla manifestly 2-lipped. Stamens 2, or only 2 with anthers.

Upper lip nearly flat or spreading, 2-lobed at the end. Throat of calyx bearded. Sterile filaments 2.

Upper lip arched, entire or slightly notched, holding the stamens.

Calyx equally 5-toothed. Flowers in close and leafy-bracted heads.

Calyx 2-lipped. Anthers with one cell at the end of a long connective astride the end of the filament.

Corolla 2-lipped. Stamens 4, all with anthers.

Upper and inner pair of stamens longer than the lower or outer pair; all ascending under the upper lip.

Upper and inner pair of stamens shorter than the lower pair.

Upper lip of the corolla flat and open, or barely concave.

Stamens distant or diverging, not approaching the upper lip.

Calyx tubular, equally 5-toothed, 15-nerved. Stamens long.

Calyx 10–13-nerved, ovate, bell-shaped or short-tubular.

Calyx naked in the throat. Flowers clustered in the axils or spiked.

Calyx hairy in the throat.

Flowers spiked, and with large colored bracts.

Flowers loosely clustered; bracts minute.

Stamens with their anthers approaching in pairs under the upper lip.

Calyx tubular, bell-shaped and 2-lipped. Corolla curved upwards. Flowers few in loose clusters.

Upper lip of the corolla arched or hood-like.

Calyx 2-lipped, closed over the fruit and very veiny; the lips toothed.

Calyx not 2-lipped, 10-toothed. Clusters axillary, head-like.

Calyx not 2-lipped and only 5-toothed, bell-shaped or top-shaped, much shorter than the corolla.

Corolla enlarged in the throat. Calyx-teeth not spiny.

Corolla not enlarged in the throat. Calyx top-shaped with spiny teeth.

*** Stamens 4, ascending, and projecting from the upper side of the corolla.

Corolla cleft down the upper side, the lower lobe much larger than the other 4. Flowers purplish, rarely white, in a spike; akenes veiny.

1. O'CIMUM.

2. LAVANDULA.

3. MENTHA.

4. HEDROMA.

5. MONARDA.

6. SALVIA.

7. NEPETA.

8. HYSSOPUS.

9. SATUREJA.

10. ORIGANUM.

11. THYMUS.

12. MELISSA.

13. BRUNELLA.

14. MARRUBIUM.

15. LAMIUM.

16. LEONURUS.

17. TEUCHIUM.

1. O'CIMUM, L. SWEET-BASIL.

[Supposed from the Greek, *Ozo*, to smell; in reference to its fragrance.]

Calyx 5-cleft,—the upper segment dilated, orbicular-ovate. *Corolla* with the upper lip 4-cleft,—the lower lip scarcely longer, declined, entire, flat-tish. *Stamens* 4, declinate, the lower pair longer,—the upper filaments often toothed at base. *Nutlets* ovoid, often minutely punctate. *Flowers* in terminal interrupted racemes.

1. *O. BASIL'ICUM*, L. Leaves ovate-oblong, subdentate, smooth, with ciliate petioles ; calyx reflexed after flowering.

ROYAL OCIMUM. Sweet Basil.

Fr. Basilic. *Germ.* Gemeines Basilienkraut. *Span.* Albaháca.

Root annual. *Stem* 6–12 inches high, often much branched, smoothish at base, pubescent above with short reflexed hairs. *Leaves* half an inch to an inch long ; *petioles* one-third to two-thirds of an inch long. *Bracts* ovate, acuminate, petiolate, ciliate. *Calyx* inflated-campanulate. *Corolla* whitish or bluish-white.

Gardens : cultivated. Native of India. *Fl.* July. *Fr.* September.

Obs. This fragrant little plant is one of the numerous kitchen-garden herbs, usually cultivated for culinary purposes.

2. LAVAN'DULA, L. LAVENDER.

[Latin, *lavare*, to wash,—the distilled water being used for that purpose.]

Calyx tubular, ovoid-cylindric, ribbed, with 5 short teeth, the upper one sometimes dilated and produced at apex. *Corolla* with the upper lip 2-lobed, and the lower one 3-lobed ; lobes all nearly equal, spreading. *Stamens* 4, included ; *filaments* smooth, not toothed. *Akenes* smooth and even, adnate to 4 fleshy scales on the margin of the disk. Perennial herbs, or suffruticose plants,—the stems leafy near the base, but often naked below the spike. *Flowers* in terminal spikes.

1. *L. VE'RA*, DC. Leaves hoary, lance-linear, entire, revolute on the margin ; spikes interrupted.

TRUE LAVANDULA. Lavender. Garden Lavender.

Fr. La Lavande. *Germ.* Der Lavandel. *Span.* Espliego.

Plant clothed with a short hoary tomentum. *Stem* suffruticose, branching from the base ; branches erect, 12–28 inches high. *Leaves* 1–2 inches long, crowded near the base of the branches,—often with fascicles of young leaves in the axils. *Flowers* in a terminal imbricated spike about an inch in length, with 1–2 distant cymules below. *Corolla* blue, pubescent, nearly twice as long as the calyx.

Gardens : cultivated. Native of Southern Europe and shores of the Mediterranean. *Fl.* July. *Fr.* September.

Obs. The compound tincture of the flowers of this herb (or, as the good ladies term it, “*Lavender Compound*”—) is deservedly popular, for its cordial and stomachic properties. The distilled water is also highly esteemed for its pungent and grateful fragrance. The dried flowers are used to fill scent bags to lay in drawers with linen, and the oil distilled from them is much used in the manufacture of perfumery.

3. MEN'THA, L. MINT.

[From *Minthe*, a nymph ; fabled to have been changed into this plant.]

Calyx campanulate or tubular, 5-toothed, equal or nearly so. *Corolla* with a short included tube ; the border nearly equally 4-cleft,—the upper lobe broader and usually emarginate. *Stamens* 4, nearly equal, erect, distant ; *filaments* glabrous, naked ; *anthers* with 2 parallel cells. *Pe-*

rennials, with spreading root-stocks and *cymules* (in the species mentioned here) in terminal *spikes*.

1. *M. vir'idis*, L. Stem erect; leaves oblong-lanceolate, subsessile; spikes terete, slender, elongated, tapering at summit,—the *cymules* mostly distant.

GREEN MENTHA. Spear-mint. Common Mint.

Fr. Baume verte. *Germ.* Die Spitzmuenze. *Span.* Menta puntiaguda.

Plant smoothish and rather pale green. *Stem* 1–2 feet high, branching. *Leaves* 1–2 or 3 inches long, very acute, incised serrate. *Spikes* of *cymules*, often numerous, 2–4 inches long. *Corolla* pale purple.

Moist grounds, waste places, &c. : introduced. Native of Europe. *Fl.* July–August. *Fr.* September.

Obs. This pleasantly aromatic herb has been so generally introduced into all the older settlements of this country, that it is now very extensively naturalized. It is deservedly popular as a domestic medicine, in relieving nausea, &c., and it is the species employed in preparing that most seductive beverage, known as “Mint Julep.”

2. *M. piperi'ta*, L. Leaves ovate-lanceolate, petiolate; spikes cylindric, rather short, obtuse,—the *cymules* loosely approximated.

PEPPERY MENTHA. Pepper-mint.

Fr. La Menthe. *Germ.* Pfeffer-muenze. *Span.* Menta piperita.

Plant smoothish and purplish. *Stem* 1–2 feet long, branching. *Leaves* 1–2 inches long, more or less ovate and rounded at base, dark green, on *petioles* one-fourth to half an inch in length, rather acute, serrate. *Spikes* of *cymules* half an inch to an inch or more in length, terminal, solitary,—the *cymules* crowded,—except the lower pair which are often a little distant. *Corolla* purple, larger than in the preceding species.

Moist low grounds, gardens, &c. : introduced. Native of Europe. *Fl.* August. *Fr.* Sept. – October.

Obs. This most grateful aromatic is generally allowed a place in gardens, or about houses,—and is apparently naturalized in many localities. The essential, oil, and distilled water, are well known for their stomachic properties, and deservedly held in high esteem.

The plant is largely cultivated, especially in the State of New-York, for the manufacture of the Oil of Peppermint, of which great quantities are consumed by confectioners in flavoring candies, lozenges, &c., and by druggists and liquor-dealers in preparing essences, cordials and the like. Essence of Peppermint, a popular aromatic remedy for pains in the stomach, &c., is a solution of the oil in alcohol, of a strength corresponding to the price at which it is sold. Besides the species mentioned, there is another foreign one sparingly naturalized around old settlements in Ohio and Pennsylvania, the Corn-mint, (*M. arven'sis*, L.,) which has axillary *cymules*, and the stem hairy downwards; its odor is remarkable, and has been compared to that of decaying cheese. A native species, *M. Canaden'sis*, L., is common in wet grounds; it has an odor much like that of Pennyroyal.

4. HEDEO'MA, *Pers.* PENNYROYAL.

[Greek, *Hedeia Osme*, a pleasant odor ; from its fragrance.]

Calyx ovoid-tubular, gibbous on the under side near the base, 13-nerved, bilabiate,—the upper lip 3-toothed—lower one bifid ; throat villous. *Corolla* bilabiate,—the upper lip erect, flat—lower lip spreading, 3-lobed, lobes nearly equal. *Stamens* 2, ascending, the two upper entirely wanting,—or rudimentary and sterile. *Herbs* with small leaves and loose axillary clusters of flowers, often forming terminal leafy racemes.

1. *H. PULEGIOIDES*, *Pers.* Leaves lance-ovate, rather obtuse, subserrate, narrowed at base, petiolate ; cymules about 3-flowered.

PULEGIUM-LIKE HEDEOMA. American-Pennyroyal.

Root annual. *Stem* 6–12 inches high, hoary-pubescent, branched. *Leaves* half an inch to an inch long, slightly pubescent, narrowed at base to a pubescent *petiole* one-eighth to half an inch in length,—the *floral leaves* resembling the cauline ones. *Cymules* usually 3-flowered ; *bracteoles* linear-lanceolate, scarcely as long as the pedicels. *Corolla* pale blue, with purple spots. *Stamens* scarcely exerted, ascending, the anthers approximated under the upper lip,—the upper pair of stamens reduced to mere abortive rudiments.

Slaty soils, old fields, &c. : throughout the United States. *Fl.* July–August. *Fr.* September.

Obs. A warmly aromatic little herb,—in general use as a popular diaphoretic, carminative, &c., and therefore entitled to a description by which it may be certainly recognized. This is not the “Pennyroyal” of Europe ; but has been so called because of its resemblance to that plant,—which is a species of Mint—viz., the *Mentha Pulegium*, *L.*

5. MONAR'DA, *L.* HORSE-MINT.

[Dedicated to *Nicholas Monardes*, a Spanish Botanist.]

Calyx tubular, elongated, 15-nerved, nearly equally 5-toothed ; throat usually hairy. *Corolla* with a slightly expanded throat, and a strongly 2-lipped limb ; upper lip entire, or slightly notched, erect, embracing the filaments ; lower lip spreading, 3-lobed, the middle lobe narrowest and slightly notched. *Stamens* 2, elongated, ascending, inserted in the throat of the corolla ; anthers linear, the divaricate cells confluent at the junction. *Flowers* large in a few whorled heads closely surrounded with bracts.

1. *M. did'yma*, *L.* Leaves ovate-lanceolate, acuminate, mostly rounded or somewhat heart-shaped at base, the floral ones and large exterior bracts purplish ; calyx smooth, incurved, nearly naked in the throat ; corolla smooth, much elongated, bright red ; stamens exerted beyond the acute upper lip of the corolla.

Oswego Tea. Bee Balm.

Root perennial. *Stem* 1–2 feet high, 4-angled, branching, somewhat hairy. *Leaves* 3–5 inches long and 1–2 inches wide, somewhat hairy on both sides, especially on the veins below ; *petioles* half an inch long. *Flowers* in 1–2 (rarely 3) whorls ; *corolla* an inch and a half long.

New England, West and South. July–August.

Obs. A very showy plant, often found in fertile soil along streams, and very common in gardens.

2. *M. punctata*, L. Leaves lanceolate, narrowed at base; bracts lanceolate, obtuse at base, yellowish and purple; calyx pubescent, with short rigid teeth; corolla nearly smooth, yellowish, the upper lip spotted; stamens not exceeding the upper lip of the corolla.

Horse-mint.

Root perennial or biennial? *Stem* 2-3 feet high, obtusely 4-angled, whitish downy. *Flowers* in several whorls; *calyx* somewhat curved with a short beard in the throat.

Sandy fields New York and Southward. August-September.

Obs. This very odorous and pungent plant abounds in a volatile oil, and possesses stimulant qualities which give it a place among the domestic remedies, it being used in cholics, &c. The oil which the plant affords by distillation is one of the most powerful of its class, and is used as an external application in rheumatism, &c. It should be used with caution, as it in some persons blisters the skin. In some parts of the South the plant is incorrectly called "*Origanum*," which has been corrupted into "*Rignum*." *

6. *SALVIA*, L. SAGE.

[Latin, *salvare*, to save; on account of supposed medicinal virtues.]

Calyx subcampanulate, bilabiate,—the upper lip mostly 3-toothed—the lower one bifid; throat naked. *Corolla* ringent,—the upper lip erect, straight, or falcate. *Stamens* 2; *anthers* halved,—the cells separated by the long linear *connective*, which is transversely articulated with the filament. *Flowers* mostly large and showy, in spiked racemed or paniced whorls.

1. *S. OFFICINALIS*, L. Stem shrubby at base, leafy, hoary-tomentose; leaves lance-oblong, crenulate, rugose; upper lip of the corolla as long as the lower one, somewhat vaulted. (See figs. 152 and 153.)

OFFICINAL *SALVIA*. Sage. Garden Sage.

Fr. La Sauge. *Germ.* Die Salbei. *Span.* Salvia.

Root perennial. *Stems* 1-2 feet high, growing in bunches, branching from the base. *Leaves* 1-2 or 3 inches long, rather obtuse, sometimes lobed near the base, clothed with a short pubescence, greyish green,—the upper or floral leaves sessile—the others on petioles about an inch long. *Cymes* 5-10-flowered, in interrupted terminal racemes. *Corolla* mostly violet-purple.

Gardens: cultivated. Native of Southern Europe. *Fl.* May-June. *Fr.* July-August.

Obs. Generally cultivated in kitchen gardens, for culinary purposes. The infusion makes a good gargle, and is otherwise moderately medicinal. The plant would seem to have been once considered as a kind of panacea, if we may judge from the following monkish lines:

"Cur moriatur homo cui *Salvia* crescit in horto?
Contra vim mortis non est medicamen in hortis.
Salvia salvatrix, Naturæ conciliatrix.
Salvia cum *Ruta* faciunt tibi pocula tuta."

There is now, however, but little confidence placed in the virtues thus imputed or implied; and in these temperance times, the doctrine of the concluding line would be denounced as rank heresy,—even though the charm be fortified “with Rue,”—that “herb of grace o’ Sundays,” as SHAKESPEARE terms it—which is here appropriately enough associated with an indulgence in cups! We often find, on dry sterile meadow banks, a native species of this genus (*S. lyra'ta*, L.), which is a mere weed, but scarcely of sufficient importance to require a description here. Several tropical species are cultivated in gardens and green-houses; some of which have the calyx, as well as the corolla, highly colored, and are very showy.

7. NE'PETA, L. CATNIP.

[Supposed to be named from *Nepete*,—a town in Italy.]

Calyx tubular, sometimes ovoid, about 15-nerved, obliquely 5-toothed. *Corolla* bilabiate,—the upper lip erect, somewhat concave, emarginate or bifid—the lower lip spreading, 3-lobed, middle lobe largest; throat dilated. *Stamens* 4, ascending,—the lower pair shorter; *anthers* mostly approximated in pairs, 2-celled; cells diverging, finally divaricate. Perennial herbs.

1. *N. Cata'ria*, L. Hoary-pubescent; stem erect, tall; leaves oblong-cordate, acute, coarsely crenate-serrate, upper floral ones small and bract-like; cymules densely many-flowered, the upper ones crowded in a spike—the lower ones distant; calyx ovoid-tubular; corolla one half longer than the calyx.

CAT NEPETA. Cat-mint. Catnip.

Fr. Herbe aux Chats. *Germ.* Die Katzen muenze. *Span.* Gatera.

Stem 2–3 feet high, mostly several from the same root, somewhat branched. *Leaves* 2–3 or 4 inches long, green above; canescent beneath; *petioles* half an inch to an inch and a half in length. *Cymules* on short common peduncles, in interrupted terminal spikes; *bracteoles* lance linear, a little longer than the pedicels. *Corolla* ochroleucous, with a reddish tinge and purple dots, pubescent; upper lip emarginately bifid, the lower one crenate dentate, villous at base.

Fence-rows, fields, and waste places: introduced. Native of Europe. *Fl.* June–Aug. *Fr.* July–September.

Obs. This foreigner is so extensively naturalized as to be a rather troublesome weed. The dried herb, in infusion, is a highly popular medicine among the good ladies who deal in simples,—and is probably often useful. But, as a weed on the farm, it is objectionable, and, when permitted to multiply, gives to the premises a very slovenly appearance.

2. *N. Glecho'ma*, Benth. Stem procumbent, radicating at base; leaves cordate-reniform, rounded, crenate, all alike; cymules few-flowered,—all distant, axillary; calyx tubular; corolla nearly three times as long as the calyx.

Ground Ivy. Ale-hoof. Gill.

Fr. Lierre terrestre. *Germ.* Die Gundelrebe. *Span.* Yedra terrestre.

Stem 6–18 inches long, slender and prostrate,—the *flowering branches* erect or ascending, 4–8 or 10 inches high, retrorsely pubescent. *Leaves* three-fourths of an inch to an inch and a half long, and rather wider than long; *petioles* 1–3 inches long. *Cymules* all distant; *bracteoles* minute, subulate and ciliate. *Corolla* blue or purplish-blue (rarely white), pilose—the upper lip bifid. *Anthers* approximated in pairs,—the cells diverging and presenting the figure of a cross.

Fence-rows and moist shaded places: introduced. Native of Europe and Northern Asia. *Fl.* May–June. *Fr.* July.

Obs. Naturalized about many settlements, and being a mere weed, is often inconveniently abundant. The herb was employed in England to clarify and give a flavor to ale (whence one of its common names), until the reign of Henry VIII., at which period hops were substituted. The infusion of the herb is a popular medicine,—like that of the preceding species.

8. HYSSO'PUS, L. Hyssop.

[Latinized from *Ezob*,—an ancient Hebrew name.]

Calyx tubular, 15-nerved, equally 5-toothed; throat naked. *Corolla* bilabiate,—the upper lip erect, flat, emarginate—the lower lip spreading, 3-lobed, middle lobe larger, bifid. *Stamens* 4, exserted, diverging, the lower pair longer; *anthers* 2-celled,—the cells linear, divaricate.

1. *H. OFFICINA'LIS*, L. Leaves linear-lanceolate, rather acute, entire, sessile; cymules secund, racemose,—the upper ones approximate.

OFFICINAL HYSSOPUS. Hyssop. Garden Hyssop.

Fr. Hysope. *Germ.* Der Isop. *Span.* Hisopo.

Root perennial. *Stem* 18 inches to 2 or 3 feet high, subterete, shrubby at base and much branched. *Leaves* three-fourths of an inch to an inch and a half long. *Cymules* rather crowded in a one-sided terminal raceme or spike, with a few distant ones below. *Corolla* bright blue, or sometimes purplish.

Gardens: cultivated. Native of Southern Europe and Asia. *Fl.* July–Aug. *Fr.* Sept.

Obs. Cultivated as a medicinal herb. The infusion has long been a popular febrifuge. The Dittany (*Cunila Maria'na*, L.)—which belongs to this tribe—is also a well-known article in the popular *Materia Medica*; but as it grows wild, and is usually confined to dry hilly woodlands, it is scarcely entitled to a place among agricultural plants.

9. SATURE'JA, L. SUMMER SAVORY.

[The ancient Latin name.]

Calyx tubular-campanulate, 10-nerved, deeply and nearly equally 5-toothed, or obscurely bilabiate; throat naked, or nearly so. *Corolla* bilabiate,—the upper lip erect, flat—the lower one spreading, 3-lobed, lobes nearly equal. *Stamens* 5, diverging. *Herbs* with small entire leaves, often fasciculate in the axils, and somewhat spiked, purplish flowers.

1. *S. HORTEN'SIS*, L. Stem erect, much branched, pubescent; leaves oblong-linear, acute; cymules axillary, pedunculate, few-flowered, somewhat secund, remote or the upper ones somewhat spiked.

GARDEN SATUREJA. Summer Savory.

Fr. La Sarriette. *Germ.* Die Saturey. *Span.* Ajedrêa.

Root annual. *Stem* 6-12 inches high, obscurely 4-angled, branched so as to appear bushy, roughish-pubescent, mostly dark purple. *Leaves* half an inch to an inch long, narrowed at base to a very short petiole. *Cymules* about 3-flowered—the upper ones crowded into a leafy spike. *Corolla* pale violet-purple, somewhat pubescent, scarcely longer than the hispid-ciliate calyx-teeth.

Gardens : cultivated. Native of Southern Europe. *Fl.* July - August. *Fr.* September.

Obs. Cultivated as a culinary herb.

10. ORI'GANUM, L. MARJORAM.

[Greek, *Oros*, a mountain, and *Ganos*, delight ; in allusion to its native locality.]

Calyx ovoid bell-shaped, hairy in the throat, 5-toothed or bilabiate with the upper lip entire or 3-toothed, the lower lip 2-toothed, truncate or wanting. *Corolla* 2-lipped ; upper lip emarginate ; lower lip longer, 3-lobed and spreading. *Stamens* 4, exserted, diverging. *Annuals* or *perennials* with nearly entire leaves and flowers in dense corymbose clusters or oblong spikes, imbricated with colored bracts.

1. O. MARJORA'NA, L. Somewhat branched ; leaves elliptic-obovate, downy and canescent on both sides ; spikelets oblong, clustered at the ends of the branches.

Sweet Marjoram.

Fr. La Marjolaine. *Germ.* Der Majoran. *Span.* Majorana.

Root annual. *Stem* 9-18 inches high, subterete. *Leaves* one third of an inch to an inch long, varying from ovate to obovate and spatulate. *Spikelets* one fourth to half an inch long, obtusely 4 cornered, hoary-pubescent, in sessile terminal clusters of threes, or on short axillary branches ; bracts very obtuse or rounded, ciliate-pubescent, quadrifariously and densely imbricated, the margins at base involute. *Calyx* with the upper lip free, like a distinct sepal, dilated, obtuse, ciliate-pilose and mostly 3-toothed at apex, narrowed below with the margins folded in, the lower lip or division ovate, smooth, very small. *Corolla* white or tinged with purple.

Gardens : cultivated. Native of Africa and Asia. *Fl.* July - Aug. *Fr.* September.

Obs. One of the fragrant culinary herbs, generally cultivated.

11. THY'MUS, L. THYME.

[The ancient Greek name ; from *Thyo*, to burn perfume.]

Calyx ovoid-tubular, 10-13 nerved, bilabiate,—the upper lip trifid—the lower one bifid ; throat villous. *Corolla* with the upper lip erect, nearly flat, emarginate,—the lower lip spreading, 3-lobed, middle lobe longer. *Stamens* 4, exserted, diverging. Humble shrubby or suffruticose perennials, with small and entire strongly veined leaves and purplish or whitish flowers.

1. T. VULGA'RIS, L. Stems erect or procumbent at base ; leaves oblong-ovate or lance-ovate, revolute on the margin ; cymules in terminal interrupted leafy spikes.

COMMON THYMUS. Garden Thyme. Standing Thyme.

Fr. Serpolet. *Germ.* Der Thymian. *Span.* Tomillo.

Stems 4–6 inches high, numerous, slender, rather erect, much branched and matted together at base, suffruticose, clothed with a short cinereous pubescence. *Leaves* one fourth to half an inch long, abruptly narrowed to a petiole, punctate, slightly pubescent beneath, fasciculate in the axils by reason of abortive branches. *Calyx* hirsute, strongly ribbed, punctate; segments of the lower lip subulate, pectinately ciliate. *Corolla* pale purple.

Gardens: cultivated. Native of Southern Europe. *Fl.* June–August. *Fr.* August–September.

Obs. A favorite condiment in culinary processes,—and generally cultivated in kitchen gardens. The creeping Thyme (*T. Serpyll'um*, L.)—a species nearly allied in properties and appearance—is naturalized in many places.

12. MELIS'SA, L. BALM.

[Greek, *Melissa*, the honey-bee; the flowers being a favorite of that insect.]

Calyx tubular, 13-nerved, bilabiate,—the upper lip mostly spreading, 3-toothed—the lower one bifid. *Corolla* bilabiate, with a recurved ascending tube, dilated above. *Stamens* 4, conniving under the upper lip; *anthers* 2-celled; cells distinct, parallel, finely diverging. *Perennial herbs* with loosely few-flowered, one-sided *cymules* in the axes of leaf-like bracts.

1. *M. OFFICINA'LIS*, L. Stem erect, branching; leaves ovate, coarsely crenate-serrate, petiolate.

OFFICINAL MELISSA. Balm. Common Balm.

Fr. La Melisse. *Germ.* Die Melisse. *Span.* Melisa.

Stem 1–2 or 3 feet high, more or less pubescent. *Leaves* 2–3 or 4 inches long; *petioles* half an inch to an inch and a half in length—the *floral leaves* resembling the cauline, but usually somewhat cuneate at base. *Cymules* 3–6-flowered on a short common peduncle. *Calyx* dry, hairy. *Corolla* white or ochroleucous, sometimes slightly tinged with purple.

Cultivated. Native of Southern Europe and Asia. *Fl.* July–August. *Fr.* September.

Obs. Commonly cultivated in gardens, and has become sparingly naturalized in some places. An infusion of the herb, or “Balm Tea,” is a popular domestic medicine, and it is probably as efficacious as any other harmless warm drink in producing perspiration.

13. BRUNEL'LA, Tournef. SELF-HEAL.

[German, *Die Braeune*, the quinsy; said to be cured by it.]

Calyx tubular-campanulate, about 10-nerved, reticulately veined, bilabiate,—the upper lip flat, dilated, truncate, with 3 short-teeth—the lower lip bifid, segments lanceolate. *Corolla* with the upper lip erect, vaulted, entire—the lower lip depending, 3-lobed, middle lobe rounded, concave, crenulate; *tube* a little contracted at throat, inflated below it on the under side, with an *annulus*, or little ring of short hairs or scales, near the base within. *Filaments* 2-toothed at the apex, the lower tooth bearing the *anther*. *Perennials* with few-flowered *cymules* clustered in imbricated spikes or heads.

1. *B. vulga'ris*, L. Leaves ovate-oblong or ovate-lanceolate, crenate dentate or obsoletely serrate, sometimes pinnatifidly incised, petiolate.

COMMON BRUNELLA. Heal-all. Self-heal.

Fr. Brunelle ordinaire. *Germ.* Gemeine Brunelle. *Span.* Brunéla.

Stem 8–12 or 15 inches high, erect or ascending, somewhat branched, especially at base. *Leaves* 1–3 inches long; *petioles* half an inch–2 inches long (those of the radical or lower leaves often 3–4 inches long); the *floral-leaves* bract-like, orbicular-cordate, sessile, with a short abrupt acumination, the lower ones conspicuously acuminate. *Cymules* 3-flowered, crowded into compact imbricated oblong terminal spikes. *Bracteoles* none. *Corolla* violet-purple (rarely pale purple or nearly white), smoothish.

Fields, road-sides, open woodlands, &c.: introduced. Native of the old world. *Fl.* July–September. *Fr.* August–November.

Obs. This plant appears to be distributed over the four quarters of the globe; but I should judge it not to be a native, here. Although not a pernicious weed, it is so common, on our farms, that it seemed proper to notice it in this work. Its ancient reputation for healing wounds—like that of many other such medicaments of the olden times—is now quite obsolete. The famous Mad-dog Scull-cap (*Scutella'ria lateriflo'ra*, L.)—which once figured in the Gazettes as a specific for Hydrophobia—belongs to this tribe,—and is frequent in wet meadows.

14. MARRU'BIUM, L. HOARHOUND.

[Said to be derived from the Hebrew, *Marrob*; meaning a bitter juice.]

Calyx tubular, 5–10-nerved, nearly equally 5–10-toothed,—the teeth more or less spiny-pointed, finally spreading. *Corolla* with the upper lip erect, flattish or concave, somewhat bifid—lower lip spreading, 3-lobed, middle lobe broader; tube included in the calyx. *Stamens* included; *anthers* 2-celled,—the cells divaricate. *Akenes* obtuse at summit, but not truncate. Hoary-tomentose *perennials* with rugose leaves and many-flowered axillary *cymules*.

1. *M. vulga're*, L. Stems ascending; leaves roundish-ovate or oval, crenate-dentate, softly villous and canescent beneath; calyx with 10 subulate recurved teeth.

COMMON MARRUBIUM. Hoarhound.

Fr. Marrub blanc. *Germ.* Der weisse, Andorn. *Span.* Marrubio.

Stems 9–18 inches high, caespitose or branching from the base. *Leaves* about 2 inches long, abruptly narrowed at base to a flat nerved woolly *petiole* half an inch to an inch long. *Cymules* dense, sessile in the rather distant axils; *bracteoles* subulate. *Corolla* white, small.

Stony banks and waste places: introduced. Native of Europe and middle Asia. *Fl.* July–August. *Fr.* September.

Obs. This has been introduced as a medicinal herb,—and is partially naturalized in many places. It has a weed-like appearance, but does not incline to spread much,—and may well be tolerated to some extent, for its valuable tonic properties. The Syrups and Candies, prepared from or with it, are excellent pectoral medicines.

15. LA'MIUM, L. DEAD-NETTLE.

[Greek, *Laimos*, the throat ; from its gaping flowers.]

Calyx tubular-campanulate, about 5-nerved ; teeth 5, nearly equal, subulate at apex. *Corolla* dilated at the throat,—the upper lip ovate or oblong, arched, mostly narrowed at base ; lower lip with the middle or lower lobe broad, emarginate, contracted at base and substipitate ; the lateral ones small at the margin of the throat. *Stamens* 4, ascending under the upper lip ; *anthers* approximated in pairs, 2-celled ; cells finally divaricate. *Akenes* triquetrous with the angles acute truncate at summit, smooth, or minutely rugose-tuberculate.

1. *L. amplexicaule*, L. Leaves rounded, crenately incised,—the lower ones petiolate—the floral ones sessile, amplexicaul ; tube of the corolla naked within, the lateral lobes not toothed ; anthers hirsute.

STEM-CLASPING LAMIUM.—Dead Nettle. Hen-bit.

Fr. Le Lamier. *Germ.* Die Taube-nessel. *Span.* Ortiga muerta.

Root annual. *Stems* several, or much branched from the base, decumbent or ascending, 6–12 inches high, mostly purplish. *Leaves* half an inch to three quarters in length, and mostly wider than long, the lower or cauline ones on *petioles* half an inch to an inch long. *Cymule* densely many-flowered, axillary, the lower ones distant, the upper ones rather approximated. *Calyx* sessile, hirsute. *Corolla* bright purple, pubescent, the galeate upper lip nearly entire, clothed with a purple villus ; lower lip obcordate ; throat dilated, laterally compressed ; tube slender, much exserted. The *corolla*, in the lower cymules, is often minute or wanting.



Gardens and cultivated lots: introduced. Native of Europe and Northern Africa. *Fl.* April–May. *Fr.* June.

Obs. This worthless little weed is abundantly naturalized in and about our gardens in Pennsylvania,—and requires some attention to keep it in

FIG. 151. A flower of the Garden Sage (*Salvia officinalis*). 152. The same with the corolla removed and the calyx divided to show the pistil and 4-lobed ovary. 153. The Purple Lamium (*Lamium amplexicaule*).

due subjection. Another species (*L. purpu'reum*, *L.*) has also been introduced in some localities ; but it does not appear to multiply so rapidly.

16. LEONU'RUS, *L.* MOTHERWORT.

[Greek, *Leon*, a lion, and *Oura*, a tail ; from some fancied resemblance.]

Calyx turbinate, 5 – 10-nerved,—the limb truncate, 5-toothed ; teeth subulate, subspinescent, finally spreading. *Corolla* bilabiate,—the upper lip oblong, entire, flattish or somewhat arched—lower lip spreading, 3-lobed,—the lateral lobes oblong—the middle one entire or sometimes obcordate. *Stamens* 4, ascending under the upper lip ; *anthers* approximated in pairs, 2-celled, the valves naked. *Akenes* triquetrous, truncate at summit, smooth. Mostly *perennial herbs* with cut-lobed leaves and close whorls of *flowers* in their axils.

1. *L. Cardia'ca*, *L.* Lower stem-leaves palmate-lobed, the upper ones cuneate-oblong, mostly trifid, with a lengthened narrow base,—the lobes of all the leaves ovate or lanceolate ; corolla longer than the calyx-teeth ; the tube with a villous ring within at base ; upper lip flattish, hirsutely villous ; lower lip spreading, the middle lobe entire.

CARDIAC LEONURUS. Motherwort.

Fr. L'Agripaume. *Germ.* Das Herzgespann. *Span.* Agripalma.

Root perennial. *Stem* 2–4 feet high, branched at base and above, retrorsely pubescent, with a hairy ring at the joints or nodes. *Leaves* 2–4 inches long, rugose, the lower ones nearly orbicular in the outline ; *petioles* 1–2 inches long. *Cymules* 3–6 or 8-flowered, sessile, distant, forming an interrupted leafy *spike* 6–12 or 15 inches in length ; *bracteoles* subulate, smooth. *Calyx* strongly 5-ribbed, smoothish ; teeth acuminate, pungent, the lower ones rather longer. *Corolla* pale purple, externally very villous, especially on the upper lip. *Akenes* hirsute at summit.

Fence rows and waste places : introduced. Native of Europe and Asia. *Fl.* June–July. *Fr.* August.

Obs. This foreigner is completely naturalized, and is apt to occupy all neglected nooks and waste places about farm-yards and along field-sides. It is an utterly worthless weed—unsightly and disagreeable,—and speedily gives a forlorn appearance to the premises of the slothful and slovenly farmer. There is another species (*L. marrubias'trum*, *L.*) which has become partially naturalized in some districts ; but it does not threaten to become so prevalent and troublesome.

17. TEU'CRIMUM, *L.* GERMANDER.

[Named from *Teucer*, a Trojan prince, who, it is said, first used the plant.]

Calyx tubular-campanulate, nearly equally 5-toothed. *Corolla* with the tube short,—the 4 upper lobes of the limb nearly equal, oblong and declined, or very short and rather erect,—the lowest lobe largest, oblong or rounded, mostly concave. *Stamens* 4, exerted from the cleft between the upper lobes of the corolla ; *anthers* with the cells confluent. *Cymules* few-flowered in a terminal rather crowded greyish-green *spike*.

1. **T. Canaden'se, L.** Herbaceous, erect, hoary-pubescent; leaves ovate-lanceolate, acute, serrate, rounded at base, on short petioles.

CANADIAN TEUCRIUM. Wood Sage. Germander.

Root perennial. *Stem* 1-2 or 3 feet high, simple or sparingly branched, square with the sides, concave and the angles obtuse, clothed with a retrorse cinereous pubescence. *Leaves* 3-5 inches long, on *petioles* one fourth to three fourths of an inch in length. *Cymes* 2-3-flowered, mostly crowded, sometimes a little distant, in a *spike* 2-5 or 6 inches in length (often an opposite pair of racemes from the axils of the first leaves beneath). *Corolla* pale purple, minutely pubescent; *limb* declinate, with a central fissure on the upper side—the upper or lateral lobes erect, acute, the middle or lowest lobe oblong or obovate, concave. *Style* longer than the stamens, curved, equally bifid at summit.

Fence rows and low shaded grounds: throughout the United States. *Fl.* July. *Fr.* August-September.

Obs. This plant is frequently to be seen in low grounds, along streams, and sometimes along fence-rows and borders of fields; but it has not become generally known as an intrusive weed. An observing farmer, however, has recently brought to me some specimens of it collected in his fields,—where, he assured me, he found it a very troublesome weed—and moreover, exceedingly difficult to extirpate. I have, therefore, deemed it proper to describe the plant, and commend it to further notice,—so that its true character may be certainly determined, before its inroads become extensive. Since the above remark was written (1846), the plant has become very troublesome on some farms in Pennsylvania.

ORDER L. BORRAGINA'CEÆ. (BORAGE FAMILY.)

Mostly rough hairy *herbs* with round *stems*, alternate simple *leaves* without *stipules* and *flowers* in often 1-sided clusters or racemes which are spiral (*circinate*) before expansion. *Calyx* 5-parted. *Corolla* mostly regular; the limb 5-toothed, with 5 *stamens* inserted on its tube. *Ovary* deeply 4-lobed; the *style* proceeding from the base of the *lobes*, which in *fruit* become little nuts or hard *akenes*, each with a single *seed* without *albumen*. *Herbage* not aromatic.

An Order for the most part of rough homely plants, some of them very obnoxious weeds. A few are slightly medicinal. The Alkanet of commerce (a red coloring matter) is afforded by a plant of this Order, viz.: *Anchusa tinctoria, L.* Several species have showy flowers, and some of the *Heliotropiums* are admired for their fragrance.

* *Akenes* or lobes erect, fixed by the lower end, separate from the style, not prickly. *Corolla* somewhat irregular, throat naked and open.

The rather unequal *stamens* protruding.

Corolla regular.

Its throat closed by 5 converging scales.

Its throat open, with 5 more or less evident projections; lobes spreading, round, imbricated in the bud, white.

** *Akenes* or lobes prickly, fixed by their side or upper end to the base of the style. *Corolla* salver-shaped with 5 scales in the throat.

Akenes erect, prickly on the margins only.

Flowers small.

Akenes oblique or flattened from above, prickly or rough all over.

1. **ECHIUM.**

2. **SYMPHYTUM.**

3. **LITHOSPERMUM.**

4. **ECHINOSPERMUM.**

5. **CYNOGLOSSUM.**

1. **E'CHIUM, Tournef. VIPER'S-BUGLOSS.**

[Greek, *Echis*, a viper; from the resemblance of the seeds to a viper's head.]

Corolla subcampanulate, limb obliquely 5-lobed, unequal, the throat ex-

panded, naked. *Stamens* mostly exserted, unequal. *Nutlets* roughened or wrinkled, fixed by a flat base.



1. *E. vulga're*, L. Stem tuberculate-hispid; leaves linear-lanceolate, hispid; flowers in lateral secund spikes, disposed in a long narrow raceme.

COMMON ECHIUM. Blue-weed. Viper's Bugloss. Blue Devils.

Fr. Herbe aux Vipères. Ger. Der Natterkopf. Span. Yerba de la Vibora.

Root biennial. Stem 2-3 feet high, branched above. Radical-leaves 5-8 inches long, lanceolate, petiolate; stem-leaves smaller, linear-lanceolate, acute sessile. Spikes numerous, axillary, secund and at first recurved, finally erect. Corolla at first purplish, finally bright blue, pubescent externally. Akenes subovoid, angular on the inner side, keeled on the back, a little incurved and acuminate, rough with tubercles of a greyish-brown color.

Fields and road-sides: introduced. Native of Europe. Fl. June. Fr. August.

Obs. This showy but vile weed, has become extensively naturalized in some portions of our country,—and is a sad pest wherever it establishes itself. I have seen it in considerable quantities in the State of Maryland, and of late years it has become abundant in New York—though I think it is yet rare in Pennsylvania.

Prof. A. GRAY informs us (*Silliman's Journal*, Vol. 42, p. 13), that in the valley of the Shenandoah, Virginia, "for the distance of more than a hundred miles, it has taken complete possession, even of many cultivated fields." A veteran editor of a newspaper in the "Old Dominion," has long been noted for harping on the Ovidian phrase—"*Principiis obsta*,"—i. e. meet and resist beginnings—or nip the first buddings of evil. If he had taught his agricultural fellow-citizens to apply his favorite maxim, practically to this plant, he would "have done the State some service:" and every farmer would do well to bear that maxim in mind,

FIG. 154. Flowering summit of Viper's Bugloss (*Echium vulgare*).

not only in reference to this, but to all pernicious weeds. It would save a vast deal of vexatious labor at a future day.

2. SYM'PHYTUM, *Tournef.* COMFREY.

[Greek, *Symphyo*, to join ; from its supposed healing virtues.]

Corolla tubular with 5 short spreading teeth ; the *throat* inflated and closed by 5 linear-awl-shaped *scales*. *Stamens* included ; *anthers* elongated. *Nutlets* smooth, ovate, fixed by a large hollowed base. Coarse *perennials* with mucilaginous *roots* and yellowish white *flowers* in nodding hispid *racemes*.

1. *S. officinale*, L. Stem winged above by the decurrence of the sessile leaves ; lower leaves ovate-lanceolate, tapering to a petiole, the upper narrower.

OFFICINAL SYMPHYTUM. Comfrey.

Stem 2-3 feet high, branched, grooved or angular, and hispidly pilose. *Leaves* 6-12 inches long, rugose ; *petioles* of the lower ones 3-5 inches in length. *Racemes* without bracts, the flowers rather crowded. *Corolla* rarely purplish ; *scales* of the throat glandular dentate.

Gardens, and naturalized in some places. Native of Europe. June.

Obs. Formerly used as a remedy for "internal wounds," and still has some reputation in diseases of the lungs and bowels. The root is the part used ; it imparts a strong mucilage to water and has a slight astringency, and is at least harmless if not efficacious.

3. LITHOSPER'MUM, *Tournef.* GROMWELL.

[Greek, *Lithos*, a stone, and *Sperma*, seed ; from the stony hardness of its seeds.]

Corolla funnel-form or salver-form ; limb 5-lobed ; throat naked, or with 5 small gibbous projections. *Anthers* oblong, subsessile, included. *Akenes* bony, smooth or rugose, fixed by the base.

1. *L. arven'se*, L. Hispidly pilose ; leaves lance-linear, rather acute, entire, nerveless ; akenes rugose-pitted.

FIELD LITHOSPERMUM. Stone-weed. Gromwell.

Fr. Grémil des champs. *Germ.* Acker Steinsame.

Roots annual. *Stem* 12-18 inches high, generally much branched from the root, and often branched near the summit. *Leaves* 1-2 inches long,—the lower ones often oblanceolate and obtuse. *Flowers* axillary, solitary, subsessile. *Corolla* ochroleucous, small, destitute of folds or appendages. *Akenes* ovoid, acuminate, rugose, brown when mature.

Grain-fields and pastures : introduced. Native of Europe. *Fl.* May. *Fr.* June.

Obs. A worthless little foreigner, more noticeable for its frequency in our fields, than for any intrinsic importance, even as a weed. According to the doctrine of signatures—a fanciful theory of the early days of medical science, which assumed that all medicinal substances indicated by some external character the diseases to which they were adapted, or the part of the body which they were supposed to affect—this, and other species, were formerly a reputed cure for the stone in the bladder, from the stony-like appearance of its seeds ; whence one of the popular names.



3. ECHINOSPER'MUM, Swartz. STICKSEED.

[Greek, *Echinos*, a hedgehog, and *sperma*, seed ; from the prickly nutlets.]

Corolla salver-form, about the length of the calyx ; lobes rounded ; the throat closed with 5 short scales. *Stamens* included. *Nutlets* erect, fixed laterally to the base of the style or central column, triangular or compressed, the back armed with 1 – 3 rows of *prickles* which are barbed at the apex, otherwise naked. Rough-hairy greyish *herbs*, with small blue flowers in bracted racemes.

1. *E. Lap'pula*, Lehm. Stem paniculately branched above ; leaves lanceo-

FIG. 155. Corn Gromwell (*Lithospermum arvense*). 156. The fruit of 4 smooth nutlets, enlarged.

late, rather obtuse, rough-hairy; nutlets each with a double row of prickles on the margins, and tubercled on the back.

Stickseed. Narrow-leaved Stickseed.

Annual or biennial. Stem a foot or more in height, covered with greyish spreading hairs, simple below. *Leaves* 1–2 inches long, very hairy; the hairs mostly tuberculate at the base. *Flowers* in leafy racemes, the pedicels very short.

Waste places. Native of Europe. July.

Obs. Rather common in some localities. The nutlets adhere to the coats of sheep and cattle, and on this account the weed is a troublesome one.

4. CYNOGLOSSUM, *Tournef.* HOUND'S-TONGUE.

[Greek, *Kyon*, a dog, and *Glossa*, a tongue; from the form of the leaves.]

Corolla funnel-form—the tube nearly as long as the calyx; throat closed by 5 obtuse scales; limb 5-lobed; the lobes very obtuse. *Stamens* included. *Nutlets* depressed or convex, oblique, fixed near the apex to the base of the style, roughened all over with short barbed or hooked prickles. Coarse *herbs* with a strong unpleasant odor, and mostly panicled *racemes* which are naked above, but usually *bracted* at the base. Lower leaves petioled.

1. *C. Moriso'ni*, *DC.* Stem erect, somewhat hispid, divaricately branched at summit; leaves ovate, lanceolate, acuminate, narrowed at base; racemes somewhat in pairs, with the rachis villous; pedicels finally reflexed; fruit densely covered with uncinatè prickles.

MORISON'S CYNOGLOSSUM. Beggar's Lice.

Root annual. *Stem* 2–4 feet high. *Leaves* 3–4 inches long, acute at each end, scabrous, the lower ones petiolate—the upper ones subsessile. *Racemes* terminating the slender divaricate branches, mostly dichotomous; *pedicels* about as long as the fruit. *Corolla* bluish-white, small.

Fence-rows and borders of thickets: Northern and Middle states. *Fl.* July. *Fr.* October.

Obs. The slovenly farmer is apt to get a practical acquaintance with this obnoxious weed, in consequence of its racemes of bur-like fruit entangling the manes of his horses, and the fleeces of his sheep.

2. *C. officina'le*, *L.* Softly pubescent; stem paniculate above, leafy; upper leaves lanceolate, closely sessile by a rounded or slightly heart-shaped base; racemes nearly bractless; nutlets flat on the broad upper face, somewhat margined.

OFFICINAL CYNOGLOSSUM. Hound's-tongue.

Biennial. Stem about 2 feet high. *Radical leaves* 9–12 inches in length, lance oblong, petiolate; *stem leaves* 3–6 inches long. *Racemes* 2–5 inches long, mostly erect, secund; *pedicels* $\frac{1}{4}$ – $\frac{1}{2}$ an inch in length; *corolla* reddish or purplish brown, (rarely white).

Waste places and pastures. Native of Europe. May–July.

Obs. Troublesome in the same manner with the preceding species. The disagreeable odor of the plant has been compared to that of nests of young mice.



ORDER LI. CONVOLVULA'CEÆ. (CONVOLVULUS FAMILY.)

Mostly *trailing* or *twining* herbs, often with a milky juice ; *leaves* alternate (in *Cuscuta* reduced to minute scales) ; *flowers* regular, hexandrous ; *calyx* of 5 imbricated persistent *sepals* ; *corolla* 5-plaited or 5-lobed, twisted or convolute in the bud ; *ovary* 2-celled (rarely 3-celled) with a pair of erect ovules in each cell, the cells sometimes doubled by a false partition between the seeds, so becoming 4-celled ; the *embryo* large, curved or coiled in a mucilaginous *albumen*. *Fruit* a globular 2-6-seeded pod.

A family containing many showy plants, some of which are cultivated for ornament. The medicinal products, Jalap and Scammony, are furnished by plants of this order.

FIG. 157. Common Hounds-tongue (*Cynoglossum officinale*). 158. Portion of the corolla with the scales which close the throat. 159. The fruit, consisting of prickly nutlets adhering to the base of the style.

1 BATA'TAS, *Rumph.* SWEET POTATO.

[Apparently an aboriginal or barbarous name,—adopted for the genus.]

Corolla campanulate—the limb spreading. *Stamens* 5, included. *Style* simple; *stigma* capitate; 2-lobed. *Capsule* 4-celled, 4-valved. *Seeds* 4, erect.

1. *B. E'DULIS*, *Chois.* Stem creeping, rarely voluble; leaves subhastate—cordate with the sinus broad and shallow, often angular and partially lobed, petiolate; peduncles as long or longer than the petioles, 3-4 flowered.

EATABLE BATATAS. Sweet Potato. Carolina Potato.

Fr. Patate jaune. *Germ.* Bataten Winde. *Span.* Batata de Malaga.

Root perennial, tuberous; tubers oblong, terete, acute at each end, yellowish-white, or sometimes purple externally, yellowish within. *Stem* 4-8 feet long, slender, prostrate, radiating, pilose. *Leaves* 2-3 or 4 inches long; *petioles* about 2 inches in length. *Corolla* purple (*vide DC.*).

Gardens and lots: cultivated.

Obs. Cultivated for its large sweet edible farinaceous roots, especially in the Southern States, though its culture has been found practicable much farther North than was formerly supposed. The warm sandy soil of New Jersey produces fine specimens, and it has succeeded in some of the States of the West. In the Middle States it does not flower, but is propagated altogether by cuttings. The plant is generally supposed to have originated in tropical America; although it has extended, in cultivation, throughout the warmer portions of both continents, it has never been detected by any botanist in the wild state. The word *potato* is said to be a corruption of *Batata*, the name it bore among the aborigines of some portion of this continent. This is doubtless the potato spoken of by SHAKESPEARE, and contemporary writers; the "Irish Potato," so called (*SOLA'NUM TUBERO'SUM*), being then scarcely known in the Old World. Sweet Potatoes were among the presents which Columbus carried to Isabella, from the newly-discovered world.

2. CONVOL'VULUS, *L.* BIND-WEED.

[Latin, *Convolvo*, to entwine, or wind about; descriptive of the plant.]

Corolla campanulate. *Style* simple; *stigmas* 2, terete-linear, often revolute. *Capsule* 2-celled. *Seeds* 4, erect. *Stems* twining procumbent, often erect-spreading. *Flowers* mostly opening at dawn.

1. *C. arven'sis*, *L.* Stem voluble or often prostrate; leaves ovate-oblong, mostly obtuse, sagittate at base; peduncles mostly 1-flowered, bibracteate—the bracts small, remote from the flower.

FIELD CONVOLVULUS. Bind-weed.

Fr. Liseron des champs. *Germ.* Die Ackerwinde. *Span.* Corregüela.

Root perennial, creeping, long. *Stem* about 2 feet long, slender, branching, procumbent



or twining round other plants, twisted, a little hairy. *Leaves* an inch to an inch and a half long—the smaller ones rather acute, the larger ones obtuse and somewhat emarginate—all of them with a minute cusp at the end of the midrib; *petioles* half an inch to an inch long. *Peduncles* axillary, 1–2½ inches long, with 2 minute *bracts* half an inch to an inch below the flower. *Corolla* pale red or reddish white.

Cultivated lots: introduced. Native of Europe and Asia. *Fl.* June–July. *Fr.* Aug.

Obs. This foreigner has been introduced into some portions of our country,—and may give the farmers some trouble, if they do not guard against it. We are told that incessant vigilance is the condition on which alone the rights of freemen can be maintained; and I believe the farmer will find a similar condition annexed to the preservation of his premises from the inroads of pernicious weeds. The following remarks, from the *Flora Londinensis*, will afford some idea of the character of this *Convolvulus*, as observed in England,—and may serve as a salutary caution here:

“Beautiful as this plant appears to the eye, experience proves it to have a most pernicious tendency in Agriculture. The field of the slovenly farmer bears evident testimony of this; nor is the garden wholly exempt from its inroads. The following experiment may serve to show what precaution is necessary in the introduction of plants into a garden, especially when we want them to grow in some particular situation.

“Tempted by the lively appearance which I had often observed some banks to assume from being covered with the blossoms of this *Convolvulus*, I planted twelve feet of a bank in my garden, which was about four feet in height, with some roots of it: it was early in the spring

FIG. 160. Bindweed (*Convolvulus arvensis*.)

and the season was remarkably dry, so that I scarcely expected to see them grow ; but a wet season coming on, soon convinced me that my apprehensions were unnecessary, for they quickly covered the whole surface of the bank, to the almost total extirpation of every other plant. It being a generally received opinion, that if a plant was cut down close to the ground, it would thereby be destroyed, or at least very much weakened, I was determined to try the validity of this opinion by an experiment, and accordingly, the whole of the Convolvulus was cut down somewhat below the surface of the earth. In about a month the bank was covered with it thicker than before. I then had recourse to a second cutting, and afterwards to a third : but all these were insufficient ; for now at this present writing (August) the bank is wholly covered with it ; nor do I expect to destroy it, but by levelling the bank and destroying the roots."

The common Morning-glory is placed by some botanists in this genus, and by others, it is referred to *IPOMÆA*, which differs from Convolvulus chiefly in its capitate, and often 2 – 3-lobed stigma. This, the *Ipomœa purpu'rea*, *L.*, is sparingly naturalized about dwellings ; and a very hairy species, *I. Nil. Roth.*, is found in similar situations in the Southern States. The beautiful Cypress Vine, often cultivated, and somewhat spontaneous Southward, is *QUAM'OCLIT VULGA'RIS*, *Chois.*

3. CUS'CUTA, *Tournef.* DODDER.

[A name of uncertain derivation and obscure meaning.]

Calyx 4 – 5-cleft. *Corolla* globose-urceolate or tubular,—the limb 5 or rarely 4-cleft. *Stamens* furnished with a scale-like, often fringed appendage at the base. *Ovary* free, 2-celled and 4-ovuled ; *styles* 2, rarely united into 1. *Fruit* mostly capsular,—the pericarp membranaceous, circumscissed at base or bursting irregularly. *Embryo* spiral, filiform, more or less convolute in and around fleshy albumen. Parasitic herbs, with slender twining leafless orange-colored stems ; germinating in the earth, but speedily attaching themselves to other plants by radicating processes, through which they derive nourishment,—and, dying at the root, soon lose all direct connection with the soil. *Flowers* clustered.

1. *C. EPILI'NUM*, *Weih.* Stem filiform ; flowers in dense capitate sessile rather distant clusters ; corolla globular, 5-parted, scarcely exceeding the calyx, withering on the capsule ; scales minute ; *stigmas* elongated ; *pod* opening regularly around the base by a circumscissile dehiscence.

FLAX CUSCUTA. Flax-vine. Dodder.

Fr. Fil de terre. *Germ.* Die Flachs-seide. *Span.* Cuscuta.

Annual. Stem 2 – 3 or 4 feet long, very slender, smooth, pale orange-color. *Flowers* in small dense heads or clusters. *Calyx segments* 4 – 5 ovate, rather acute. *Corolla* yellowish-white or pale orange-color, subglobose-urceolate, 4 – 5-lobed ; lobes ovate, acute, somewhat spreading. *Stamens* inserted at the clefts of the corolla. *Scales* adnate to the corolla below the stamens, short, truncate, crenate-laciniate. *Capsule* depressed-globose. *Seeds* reddish-brown, scabrous or almost muricate under a lens.

Parasitic on flax : introduced. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This singular plant—formerly a great pest among the flax crops—has become quite rare, since the culture of flax has declined. There are several native species of this genus, the most common of which, *C. Grono'vii*, *Willd.*, is often seen in swampy places, from August to October, twining over other plants in tangled masses, which have been likened to bunches of threads of yarn, and to copper wires.

ORDER LII. SOLANA'CEÆ. (NIGHTSHADE FAMILY.)

Mostly *herbs*, with a *watery juice* and alternate *leaves* without *stipules*, regular 5-merous and 5-androus *flowers* on bractless *pedicels*; *corolla* plicate or infolded-valvate in the bud; *stamens* inserted into the corolla, as many as its lobes and alternate with them. *Fruit* a 2-celled (rarely 3-5-celled) many-seeded berry or capsule; *seeds* with fleshy albumen.

An Order comprising plants with widely different properties; sometimes the foliage and fruit are highly poisonous, while on the other hand it affords some of our most valuable esculents.

*Corolla wheel-shaped. Stamens closely converging or united around the style. Fruit a berry.

Anthers longer than the very short filaments, and connected with each other, opening lengthwise.

1. LYCOPERSICUM.

Not connected, opening at the top by two pores.

2. SOLANUM.

Anthers shorter than the filaments, heart-shaped, opening lengthwise. Berry inflated, pod-like, pulp very pungent.

3. CAPSICUM.

**Corolla between wheel-shaped and bell-shaped. Anthers separate.

Calyx becoming inflated around the eatable berry.

4. PHYSALIS.

***Corolla funnel-shaped, bell-shaped or tubular. Stamens separate; filaments slender. Calyx 5-toothed or 5-lobed.

Shrubby with vine-like branches and narrow leaves.

Corolla funnel-shaped, small. Fruit a berry.

5. LYCIUM.

Annual herbs with an unpleasant odor. Fruit a pod.

Corolla and stamens rather irregular., Pod in the urn-shaped calyx opening at the top by a lid.

6. HYOSCYAMUS.

Corolla perfectly regular, long funnel-shaped.

Calyx 5-angled, long, falling away after flowering.

Pod large and prickly.

7. DATURA

Calyx not angled, persistent. Pod smooth.

8. NICOTIANA.

1. LYCOPER'SICUM, *Tournef.* TOMATO..

[Literally *Wolf-Peach*; a metaphorical name, having reference to the fruit.]

Calyx 5-10-parted, persistent. *Corolla* rotate; tube very short; limb plicate, 5-10-lobed. *Stamens* 5-6, exserted; *anthers* oblong-conical, cohering by an elongated membrane at summit, longitudinally dehiscent on the inner side. *Ovary* 2-3-celled, with the placentæ adnate to the dissepiment, many-ovuled. *Berry* 2-3-celled. *Seeds* numerous, reniform, pulpy-villous. *Leaves* odd-pinnately dissected. *Flowers* in lateral racemose clusters.

1. *L. ESCULEN'TUM*, *Mill.* Stem herbaceous; leaves interruptedly pseudo-pinnate,—the segments petiolulate, lance-ovate, acuminate, deeply incised-serrate; fruit depressed-globose, mostly torose.

ESCULENT LYCOPERSICUM. Tomato, or Tomatoes. Love-apple.

Fr. Pomme d'amour. *Germ.* Der Liebes-Apfel. *Span.* Tomate.

Plant of a greyish aspect, viscid-pubescent and somewhat fetid. *Root* annual. *Stem* 2-4 feet long, branching, often straggling or procumbent unless supported. *Flowers* in naked lateral racemose clusters; *common peduncle* 1-2 inches long, dichotomously divided, the sub-divisions articulated to the pedicels of the flowers. *Calyx-segments* 5-10, linear-lanceolate, long. *Corolla* yellow, pubescent, the lobes 5-10, lanceolate, spreading. *Anthers* cohering, acuminate, with the points recurved. *Berries* large (1-3 or 4 inches or more in diameter), globose or flatly depressed and orbicular, often remarkably torose or distorted by large swelling ridges, red or reddish orange-color when mature.

Gardens and lots: cultivated. Native of Spanish America. *Fl.* June-August. *Fr.* August-September.

Obs. This is cultivated for its succulent acid fruit—which, as a sauce, is considered very healthful,—and has, of late years, become a favorite and almost universal dish, in its season. Numerous varieties are found in cultivation; the fruit varying in color, being yellow, deep-red and light-crimson; some have the surface smooth, and in others it is deeply furrowed. The larger berries are usually in an abnormal condition, containing numerous cells, and sometimes appearing as if produced by the union of several ovaries. The small round kind, known as “Cherry Tomato,” is probably *L. CERASIFORME*, *Dunal*; this, also, varies in color, and has probably hybridized with the ordinarily cultivated species, to produce the intermediate forms that are often met with. *

2. SOLA'NUM, L. NIGHTSHADE AND POTATO.

[A name of obscure and uncertain meaning.]

Calyx 5-10-parted, persistent. *Corolla* rotate or subcampanulate; tube short; limb plicate, mostly 5-lobed. *Stamens* mostly 5, inserted on the throat of the corolla, exserted; *anthers* connivent, opening at apex by 2 pores. *Berry* 2- (rarely 3-4) celled. *Leaves* various; *flowers* in cymose clusters—on mostly lateral and extra-axillary *peduncles*.

* *Anthers* blunt; *plants* not prickly.

1. *S. ni'grum*, L. Stem herbaceous, angular, branched, scabrous on the angles; leaves ovate, obscurely repand-dentate; flowers subumbellate; fruit globose, black.

BLACK SOLANUM. Nightshade.

Fr. Morelle noire. *Germ.* Der schwarze Nachtschatten. *Span.* Yerba mora.

Root annual. *Stem* 1-2 feet high, much branched, angular or slightly winged. *Leaves* 2-3 inches long; *petioles* about an inch long. *Umbels* lateral above the axils, few-flowered, nodding. *Corolla* white.

Waste places, about gardens and dwellings. Native of Europe. *Fl.* July. *Fr.* Sept.

Obs. A homely, worthless, and even deleterious weed,—which ought to be carefully expelled from the vicinity of all dwellings.

2. *S. Dulcama'ra*, L. Somewhat shrubby and climbing; leaves cordate-ovate, the upper ones often hastate or with 2 ear-like lobes at base; flowers in lateral cymes; fruit oval, red.



BITTER-SWEET SOLANUM. Bitter-sweet. Woody Nightshade.

Perrenial. Stem 4–8 feet long, flexuose, smoothish. *Leaves* 2–4 inches long; *petioles* half an inch to an inch in length. *Cymes* opposite the leaves, nodding; *pedicels* half an inch long, clavate; *common peduncle* about 2 inches in length; *corolla* violet-purple, the lobes spreading or reflexed, each with 2 green dots or tubercles at base. *Berry* near half an inch long.

About houses, &c. Native of Europe. *Fl.* July. *Fr.* September.

- *Obs.* Extensively naturalized in fertile soils, and is often tolerated and

FIG. 161. A branch of Nightshade (*Solanum nigrum*). **162.** A fruit. **163.** The same divided

even sometimes cultivated to train over walls and fences, as its flowers and fruit are showy. The berries are said to be poisonous, though this is denied by some authors; but as it is an unsettled question, and as their bright red appearance, when ripe, may tempt children to eat them, the plant should be regarded as a dangerous one. The twigs are used in medicine to increase the secretions of the kidneys and skin. *

3. *S. TUBERO'SUM*, L. Underground shoots producing tubers; leaves interruptedly pseudo-pinnate,—the lobes ovate, entire; fruit globular, rather small, greenish yellow.

TUBEROUS SOLANUM. Common Potato. Irish Potato.

Fr. Pomme de terre. *Germ.* Die Kartoffel. *Span.* Batatin.

Annual; the base of the stem producing tuberous oblong or roundish pedicellate rhizomas. *Stem* 2–3 feet high, thickish and succulent or fleshy, often decumbent, somewhat pubescent. *Leaves* odd-pinnately dissected,—the segments somewhat petiolulate, sometimes opposite, the alternate pairs very small. *Flowers* in terminal nodding corymbs, on a common peduncle 3–5 inches long; *pedicels* articulated. *Corolla* bluish-white. *Anthers* orange yellow, often slightly cohering. *Berries* globose, about half an inch in diameter.

Kitchen gardens and fields: cultivated. Native of South America. *Fl.* June–July *Fr.* September.

Obs. This most important plant is more or less cultivated, for its esculent tubers, by every owner or occupant of land. It is one of the indispensable crops for a family. Numerous varieties of tubers—purple, white and yellow—have been obtained, by long culture, or from seedling plants. According to M'CULLOCH, Potatoes were introduced into England, from Virginia, by SIR WALTER RALEIGH, in 1586; into Ireland in 1610,—where they have “long furnished from three-fifths to four-fifths of the entire food of the people”; and into Scotland in 1728.

** *Anthers* long and taper-pointed; *stem* and *leaves* prickly.

4. *S. ESCULEN'TUM*, Dunal. Stem herbaceous, nearly simple; leaves ovate, somewhat sinuate-lobed, tomentose; flowers 5–7 or 10-parted; peduncles solitary, thickened, nodding; calyx aculeate; fruit ovoid or oval, dark purple or white, mostly very large.

ESCULENT SOLANUM. Egg-plant.

Fr. Aubergine rouge. *Germ.* Eifrüchtiger Nachtschatten.

Whole plant clothed with a stellated tomentum. *Root* annual. *Stem* about 2 feet high, hollow, aculeate, finally subligneous. *Leaves* 6–9 inches long,—the nerves and petioles aculeate; *petioles* 1–3 inches long. *Peduncles* lateral, supra-axillary, thick, (sometimes slender and dichotomous, or bearing 2 flowers), aculeate. *Corolla* purplish, pubescent; lobes ovate, spreading. *Berries* 3–5 or 6 inches in diameter, smooth.

Gardens: cultivated. Native of India. *Fl.* July–August. *Fr.* September–October.

Obs. This is cultivated for its fruit—which is quite a favorite culinary vegetable. Long culture has produced several striking varieties, some of which have been described as species; the white-fruited variety is nearly destitute of prickles.

5. *S. Caroliner'se*, L. Stem suffruticose, branching; leaves ovate-



oblong, acute, sinuate-angled and often subhastate, prickly on both sides ; racemes simple, loose ; fruit globose, small, orange yellow.

CAROLINIAN SOLANUM. Horse-nettle.

Root perennial. *Stem* 1 to near 2 feet high, annual but firm and almost shrubby, hollow, branching, armed with sharp spreading prickles. *Leaves* 4 - 6 inches long, aculeate on the midrib and larger nerves on both sides, clothed with a hirsute stellate pubescence ; *petioles* half an inch to an inch and a half long. *Racemes* lateral, opposite to and often

FIG. 164. The Horse-nettle (*Solanum Carolinense*).

longer than the leaves. *Calyx* 5-parted, aculeate. *Corolla* bluish-white. *Berries* one-fourth to one-third of an inch in diameter.

Pastures and cultivated grounds—especially in the Southern States. *Fl.* July. *Fr.* October.

Obs. This is an exceedingly pernicious weed,—and so tenacious of life that it is almost impossible to get rid of it, when once fully introduced. It grows in patches so thickly as to deter stock from feeding among it, and even to monopolize the soil,—while its roots gradually extend around, and to a great depth. It is a native of the Southern States,—but has found its way to several localities in Pennsylvania. The farmers will do well, therefore, to enable themselves to know it when they meet it,—and moreover, to eradicate it, promptly and effectually, wherever they find it on their premises.

3. CAP'SICUM, *Tournef.* CAPSICUM.

[Greek, *kapto*, to bite ; from its hot or biting quality.]

Calyx angular, 5–6-cleft, persistent. *Corolla* sub-rotate, with a very short tube,—the limb plicate, 5–6-lobed. *Stamens* 5–6, exserted ; *anthers* shorter than the filaments, heart-shaped, longitudinally dehiscent. *Berry* nearly dry, inflated, polymorphous, incompletely 2–3-celled. *Seeds* numerous, compressed, reniform.

1. *C. AN'NUUM*, *L.* Stem herbaceous ; leaves ovate, acuminate, entire, glabrous ; peduncles solitary, axillary.

ANNUAL CAPSICUM. Red Pepper. Cayenne Pepper.

Fr. Poivre d'Inde. *Germ.* Spanischer Pfeffer. *Span.* El Pimentero, and El Chili.

Root annual. *Stem* 1–2 feet high, angular, branching above. *Leaves* 2–4 inches long, deep green ; *petioles* 1–3 inches long, semi-terete, slightly channeled above. *Corolla* white, with ovate-oblong spreading lobes. *Anthers* white, with a tinge of blue. *Berry* hollow, terete and slender, ovoid-oblong, or depressed-globose, angular or torose, red when mature.

Gardens and lots : cultivated. Native of South America. *Fl.* July–Aug. *Fr.* Oct.

Obs. Cultivated for its fruit,—which is powerfully stimulant, and much used as a condiment. Several varieties (perhaps distinct species)—with the fruit of various forms—are to be met with in the gardens. That one with slender terete elongated fruit, is sometimes cultivated on a large scale,—for the manufacture of Cayenne Pepper, from the mature fruit : the other forms with thicker rinds, are used in the green state for pickles.

In Mexico and other warm countries of this continent, this is almost one of the necessities of life. The common people living mostly upon vegetable food, use this stimulant freely, and either in its green state, “chili verde,” or ripe, “chili colorado,” it forms an accompaniment to every meal. *C. baccatum*, *C. frutescens*, and perhaps other species, furnish the imported “bird pepper” which is, when green, used to make pepper-vinegar or pepper-sauce, and in the ripe state ground to form the Cayenne of the shops.

4. PHY'SALIS, L. GROUND-CHERRY.

[Greek, *Physa*, a bladder, or bag ; in allusion to the inflated calyx.]

Calyx 5-cleft, enlarging after flowering, becoming much inflated, and including the 2-celled globular (edible) *fleshy berry*. *Corolla* spreading bell-shaped, marked with 5 concave spots at the base ; the plicate border somewhat 5-lobed or 5-toothed. *Leaves* somewhat in pairs ; *peduncles* extra axillary, nodding, 1-flowered.

1. *P. visco'sa*, L. Root perennial ; divergently branching ; leaves somewhat heart-ovate, repandly toothed ; corolla brownish in the throat.

CLAMMY PHYSALIS. Ground-cherry.

Stem 12 - 18 inches high, branched somewhat dichotomously and with the whole plant clammy pubescent. *Leaves* 2-4 inches long, varying from lance-ovate and acute to roundish ovate or sub-cordate and obtuse ; petioles 1-2 inches long. *Corolla* greenish-yellow, with fuscous or purplish brown spots at base, about twice as long as the calyx. *Berry* greenish-yellow or sometimes orange color, when mature. *Peduncles* of the fruit about an inch long.

Common in light sandy soils - also cultivated. *Fl.* July. *Fr.* September.

2. *P. ALKEKEN'GI*, L. Perennial ; leaves deltoid-ovate, acuminate ; corolla not spotted.

Strawberry Tomato. Ground-cherry.

Less branching than the preceding. *Leaves* attenuated into a long *petiole* ; 3 - 4 inches long including the petiole and $1\frac{1}{2}$ - 2 inches broad. The inflated *calyx* becoming reddish at maturity. *Berry* red.

Native of Europe. Cultivated.

Obs. Both the species of *Physalis* above-mentioned have within a few years come into cultivation. The ripe fruit has a very pleasant flavor, and is eaten raw or cooked.

5. LY'CIUM, L. MATRIMONY-VINE.

[Named from *Lycia*, in Asia Minor.]

Calyx irregularly 2 - 3 or 5-cleft, persistent. *Corolla* tubular-funnel-form ; border mostly 5-lobed, spreading. *Stamens* usually exserted ; filaments bearded. *Berry* 2-celled ; seeds reniform. *Shrubby vines* with entire leaves ; flowers solitary or in pairs on extra-axillary *peduncles*.

1. *L. Bar'barum*, L. Somewhat spinose ; branches elongated, flaccid and dependent ; leaves oblong-lanceolate, often clustered ; calyx mostly 5-cleft.

BARBARIAN LYCIUM. Bastard Jasmine. Matrimony-vine. Barbary Box-thorn. Duke of Argyle's Tea-tree.

Perennial. *Stem* 10 - 20 feet long, slender, much branched, with indurated points at the axils or base of the leaves. *Leaves* 1-3 inches long, tapering at base to a *petiole* about half an inch in length. *Peduncles* about an inch long, slender, often 2-4 together ; *corolla* greenish-purple ; *berry* oval, orange-red when mature.

About dwellings. Native of Northern Asia. June - July.

Obs. This straggling half-vine kind of shrub is partially naturalized in



many places; and being rather difficult to get rid of when once established, is often something of a nuisance. It is frequently cultivated to cover screens, &c.; but there are so many plants better adapted every way to the purpose, that its culture is not to be recommended.

6. *HYOSCY'AMUS*, *Tournef.* HENBANE.

[Greek, *Hys*, *Hyos*, a hog, and *Kyamos*, a bean, because it either is or is not poisonous to hogs,—a point upon which authors differ.]

Calyx bell-shaped or urn-shaped, 5-lobed. *Corolla* funnel-form, oblique,

FIG. 165. The Ground or Winter-cherry (*Physalis Alkekengi*). a. A fruit with half of the inflated calyx cut away.

with a 5-lobed more or less unequal plaited border. *Stamens* declined. *Pod* enclosed in the persistent calyx, 2-celled, opening transversely all round near the apex, which falls off like a lid. Clammy pubescent, fetid, narcotic herbs, with lurid flowers in the axils of the angled or toothed leaves.

1. *H. ni'ger*, L. Leaves clasping, sinuate, toothed and angled; flowers sessile, in one-sided leafy spikes; corolla dull yellowish, strongly reticulated with purple veins.

BLACK HYOSCYAMUS. Common or Black Henbane.

Annual or *biennial*. Whole plant viscid and hairy, of a glaucous hue. *Stem* 1-2 feet high. *Lower leaves* petioled, spreading on the ground. *Calyx* closely embracing the seed-vessel, strongly netted-veined. *Seeds* numerous, kidney-shaped, the surface strongly reticulated.

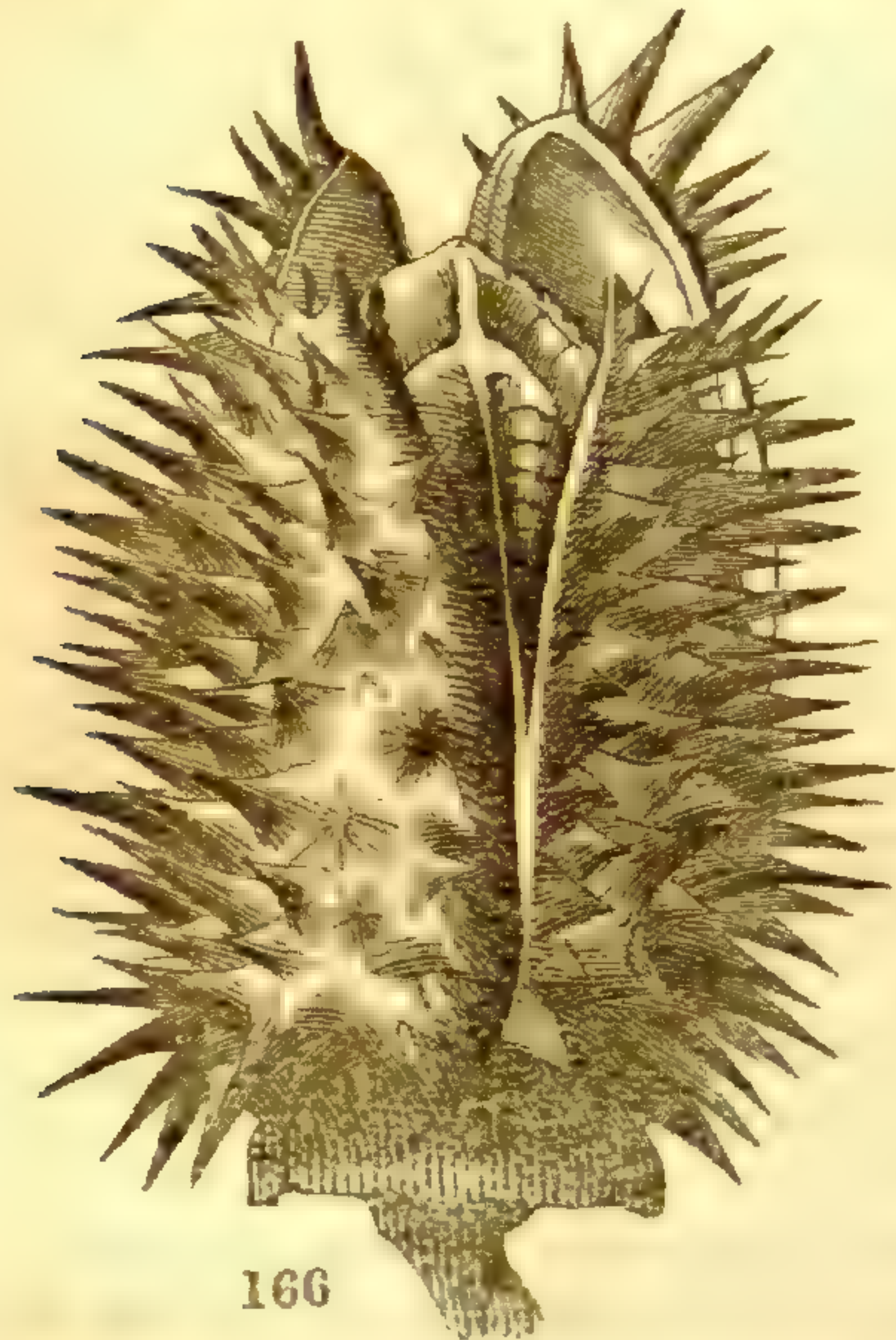
Road-sides and waste places. Native of Europe. July - August.

Obs. This plant which is but sparingly naturalized as yet, is powerfully narcotic and poisonous. A small fragment of a leaf, or a drop of the juice of the plant falling upon the eye, dilates the pupil in a remarkable manner. It is used in medicine as a substitute, in some cases, for opium.

7. DATU'RA, L. THORN-APPLE.

[Supposed to be from *Tutorah*; the Arabic name of the plant.]

Calyx tubular, prismatic, separating transversely above the base in fruit.



Corolla funnel-form, the limb spreading, plicate, 5-10-toothed. *Stamens* included. *Style* simple; *stigma* 2-lipped. *Capsule* ovoid or subglobose, prickly, (rarely smooth), half 4-celled at summit, 4-valved. *Seeds* numerous, laterally compressed, sub-reniform, roughish-dotted. *Annuals*, with coarse, fetid and narcotic leaves, somewhat in opposite pairs, and large, solitary, axillary or dichotomal flowers, on short peduncles.

1. *D. Stramo'nium*, L. Stem dichotomously branching; leaves ovate, sinuate-dentate, petiolate, smooth; capsule aculeate, erect.

Jamestown (corruptly *Jimson*) weed. Thorn-apple.

Fr. Pomme epineuse. *Germ.* Der

Stech-apfel. *Span.* Estramónio.

FIG. 166. A capsule of the Thorn apple (*Datura Stramonium*).

Root annual. *Stem* 2-5 feet high, rather stout, terete, pale yellowish-green (dark purple in *var. Tatula*), smooth. *Leaves* 4-6 or 8 inches long, sinuate or somewhat angular-dentate; *petioles* 1-3 or 4 inches in length. *Calyx* prominently 5-angled, nearly half as long as the *corolla*. *Corolla* ochroleucous (pale violet purple in *var. Tatula*), about 3 inches long; *capsule* about an inch in diameter.

Waste places, farm-yards, road-sides, &c. *Fl.* July-August. *Fr.* September.

Obs. A native of Asia or tropical America. Both varieties, the one with green and the other with purple stems, are very common. The herb and seeds are powerful narcotic poisons. They are used medically, and the dried root is sometimes smoked as a remedy for asthma. Both varieties are coarse unsightly weeds, and should be carefully extirpated by the farmer.

8. NICOTIA'NA, L. TOBACCO.

[Named in compliment to *John Nicot*; who introduced it into France.]

Calyx tubular-campanulate, persistent. *Corolla* funnel-form,—the limb spreading, plicately 5-lobed. *Stamens* included. *Style* simple; *stigma* capitate. *Capsule* covered by the calyx, septicidally 2-valved at apex, the valves finally bifid, retaining separate placentæ. *Seeds* very numerous, minute.

1. *N. TABAC'UM*, L. Leaves large, lance-ovate, sessile, decurrent; lobes of the corolla acuminate, the throat inflated.

TOBACCO NICOTIANA. Tobacco.

Fr. Le Tabac. *Germ.* Der Taback. *Span.* Tabaco.

Whole plant viscid-pubescent. *Root* annual. *Stem* 4-6 feet high, stout, finally almost woody at base, paniculately branched above. *Leaves* 1-2 feet long, smaller as they ascend. *Calyx* about one third the length of the *corolla*, ventricose, the segments lanceolate erect. *Corolla* about 2 inches long; limb rose-colored, spreading; tube pale yellowish-green. *Capsule* ovoid, sulcate on each side. *Seeds* reniform, rugose.

Fields: cultivated extensively in the Southern and Western States. Native of the warmer regions of America. Known to Europeans about the year 1560. *Fl.* July-August. *Fr.* Sept.

Obs. The extent to which this nauseous and powerfully narcotic plant is cultivated, its commercial importance, and the modes in which it is employed to gratify the senses, constitute, altogether, one of the most remarkable traits in the history of civilized man. Were we not so practically familiar with the business, we should doubtless be dis-



FIG. 167. Flowers of Tobacco (*Nicotiana Tabacum*).

posed to regard the whole story of the tobacco trade, and the uses made of the herb, as an absurd and extravagant fable. In view of the facts and circumstances, it does seem like sheer affectation, on our part, to pretend to be astonished at the indulgence of the Chinese, and other Asiatics, in the use of Opium. The habitual use of Tobacco is always more or less injurious to the system—especially the nervous system; and in many instances it is highly deleterious. I speak from long observation, and a personal experience of many years, having *smoked* and *chewed* the herb, until its pernicious effects compelled me to *es-chew* it altogether.

ORDER LIII. GENTIANA'CEÆ. (GENTIAN FAMILY.)

Smooth *herbs* with a colorless *bitter juice*, opposite, entire and *sessile leaves* without *stipules*; *flowers* regular; *stamens* as many as and alternate with the lobes of the *corolla*, which are convolute in the bud; a 1-celled ovary with 2-parietal placentæ; the *fruit* a 2-valved, septicidal many-seeded pod; *seeds* with fleshy *albumen*.

An Order containing many beautiful species—a number of them valuable for their bitter, tonic properties; among which may be mentioned the Gentian of the shops (*Gentiana lutea*, L.). Few or none, however, are of any agricultural importance.

1. SABBAT'IA, Adans. CENTAURY.

[Named after *Liberatus Sabbati*; an Italian Botanist.]

Calyx 5–12-parted. *Corolla* sub-rotate,—the limb 5–12-lobed, convolute (twisted to the right) in the bud. *Stamens* as many as the corolla-lobes; *anthers* erect, opening by a longitudinal fissure, finally recurved. *Style* 2-parted,—the branches stigmatiferous, at length spirally twisted. *Capsule* 2-valved, septicidal, 1-celled, with spongy placentæ along the sutures. *Biennials* or *annuals* with slender stems and handsome flowers in a cymose panicle.

1. *S. angula'ris*, Pursh. Stem acutely 4-angled, somewhat winged; leaves ovate, sessile and amplexicaul; calyx-segments mostly 5, linear-lanceolate, acute, much shorter than the corolla; corolla mostly 5-parted, the lobes obovate, rather obtuse.

ANGULAR SABBATIA. Centaury.

Root annual? (biennial, DC.). *Stem* 12–18 inches high, often bushy with numerous branches. *Leaves* about an inch long, 5-nerved. *Flowers* sometimes composed of 6 parts. *Corolla* rose red, with a pale green star in the centre. *Capsule* oblong-ovoid, mucronate, with a keeled suture on each side. *Seeds* rugosely pitted, under a lens.

Sterile old fields: Canada to Carolina. *Fl.* July–August. *Fr.* September.

Obs. This plant has but little connection with agriculture; yet it is so generally and deservedly popular as a bitter and tonic medicine, that it would seem desirable for every farmer to be able to identify it, and therefore I have inserted it. There is another plant in the South and West belonging to this tribe, which is highly commended for similar properties, namely, the Wild Colombo, (*Fra'sera Carolinen'sis*, Walt.) I do not deem it necessary, however, to do more than mention it here.

ORDER LIV. ASCLEPIADA'CEÆ. (MILKWEED FAMILY.)

Plants mostly with *milky-juice*, and entire, usually opposite or whorled (rarely scattered) *leaves* without *stipules*; *flowers* regular, 5-merous and 5-androus; *lobes of corolla* mostly valvate in the bud; filaments united into a tube which encloses the pistils, the tube augmented by a *crown* of 5 lobes or scales, at summit; the *anthers* united to the stigma and the *pollen* in peculiar wax-like masses as described under the first genus; *fruit* a follicle, seeds compressed and mostly margined and comose.

An Order remarkable for the peculiar structure of the flowers (well illustrated in Prof. Gray's admirable text-book), and containing a number of plants interesting to the botanist, though but few of any economical value.

1. ASCLE'PIAS, L. MILKWEED.

[The Greek name of *Æsculapius*; to whom the genus is dedicated.]

Calyx deeply 5-parted, persistent; divisions small, spreading. *Corolla* 5-parted, reflexed, deciduous. *Crown* of 5 hooded lobes, seated on the tube of the stamens, each containing an incurved horn. *Stamens* 5, inserted on the base of the corolla; filaments united into a tube, which encloses the pistil; *anthers* adherent to the stigma, each with two vertical cells, tipped with a membranaceous appendage, each cell containing a flattened pear-shaped and *waxy pollen-mass*; the two contiguous pollen-masses of adjacent anthers forming pairs which hang by their slender summits from five small black shining cloven *glands*, at the angles of the *stigma*. *Ovaries* 2, tapering into very short *styles*; the large depressed 5-angled fleshy *stigma* common to the two. *Follicles* 2, one of them often abortive, soft, ovate or lanceolate. *Seeds* flat, margined, imbricated downwardly all over the large placenta which separates from the suture at maturity, furnished with a long tuft of silky hairs at the hilum. *Perennial* herbs, with thick and deep roots; *peduncles* terminal, or mostly lateral and between the petioles, bearing simple, many-flowered umbels.

1. A. Cornu'ti, Decaisne. Leaves elliptic-ovate, acute, tomentose beneath; pods clothed with soft spinous projections and woolly.

CORNUTUS'S ASCLEPIAS. Silkweed. Milkweed.

Stem 3-4 feet high, stout, somewhat branched, smoothish. *Leaves* 6-8 inches long, acute or with a slight point; contracted at the base into a short but distinct *petiole*. *Umbels* 2-4, axillary near the summit of the stem; *common peduncles* 2-3 inches long; *pedicels* 1-1½ inches in length, with lance-linear *bracts* at base; *flowers* numerous, sweet-scented, many of them abortive; divisions of the *corolla* ovate, greenish-purple, about one-fourth the length of the pedicels; *hoods of the crown* ovate, obtuse, with a lobe or tooth on each side of the stout claw-like horn; *follicles* few, 3-5 inches long.

Rich soils: common. *Fl.* June. *Fr.* September.

Obs. This, the most common among our numerous species of the genus, has recently been noticed by a Western correspondent of one of our agricultural papers, as a most troublesome weed, and one exceedingly difficult to exterminate. It does not bear this character in the East. When well established in a fertile soil, its long deep roots will doubtless be exceedingly difficult to extirpate. The seeds are readily wafted to a great distance by means of the copious silky hairs. The plant, when



wounded, emits an abundance of milky juice, from which it receives one of its common names; the other being given to it on account of the beautifully silky hairs of the seeds. The plant was named *A. Syriaca*, by LINNÆUS, who perhaps thought it was a Syrian plant; but it is an exclusively American species. *

FIG. 168. The common Milkweed (*Asclepias Cornuti*) reduced. 169. A separate flower, enlarged. 170. Pods, reduced.

2. *A. tubero'sa*, L. Hirsute; not lactescent; stem ascending, divaricately branched at summit, leafy; leaves oblong-lanceolate or linear-oblong, mostly alternate-scattered, lowest opposite, subsessile; umbels numerous, lateral and terminal, often forming a spreading corymb.

TUBEROUS ASCLEPIAS. Butterfly-weed. Pleurisy-root.

Whole plant mostly very hairy. *Root* perennial; large, tuberous. *Stem* about 2 feet high, generally more or less oblique or leaning; branches spreading and often recurved. *Leaves* 2-4 inches long, and half an inch to an inch wide, scattered or rarely opposite, varying from lance-linear to oblong and oblanceolate, acute or obtuse, mostly obtuse at base, on very short petioles. *Stamineal crown* bright orange color,—the hoods erect, lance-oblong, distinct, abruptly narrowed below, the infolded margins with each an obtuse tooth near the base; *horns* subterete, tapering to a point, incurved. *Follicles* about 4 inches long, somewhat ventricose, acuminate, tomentose-pubescent.

Old fields, pastures and fence-rows: throughout the United States. *Fl.* July-August. *Fr.* Sept.-October.

Obs. This is inclined to make its appearance in our cultivated grounds, or pasture fields; and, though a rough, coarse weed, is not a troublesome one. When in bloom, the bright orange-colored umbels of this species are quite showy. The root once had a reputation for being medicinal; but it is now generally neglected.

2. ENSLEN'IA, Nutt. ENSLENIA.

[Dedicated to *Enslen*, an Austrian botanist, who collected in the Southern States early in the present century.]

Calyx 5-parted. *Corolla* 5-parted; the divisions erect, ovate-lanceolate. *Crown* of 5 free membranaceous leaflets, which are truncate or obscurely lobed at the apex, where they have a pair of flexuous awns united at their base. *Anthers* nearly as in *Asclepias*; *pollen-masses* oblong, obtuse at both ends, fixed below the summit of the stigma to the descending glands. *Pods* oblong-lanceolate, smooth. *Seeds* with a tuft as in *Asclepias*. Perennial twining herbs.

1. *E. al'bida*, Nutt. Leaves opposite, ovate-heart-shaped, acute, long-petioled; flowers small, in raceme-like clusters on slender axillary peduncles.

WHITISH ENSLENIA.

Stem 8-12 feet high, climbing, slightly pubescent or smooth. *Leaves* 3-5 inches long and about the same in width, with a broad sinus at base, somewhat pubescent on the nerves below; *petiole* equalling or exceeding the blade in length. *Peduncles* about half an inch long, sometimes several from the same axils; *flowers* greenish or yellowish-white, sweet-scented, on pedicels about their own length.

Alluvial soil. West and Southwest. July-September.

Obs. This plant is introduced on account of the statement of Doctor SHORT, the distinguished botanist, of Kentucky, who says that it is a great nuisance on the farms along the Ohio river. We are not informed whether it has acquired a popular name. *



ORDER LV. OLEA'CEÆ. (OLIVE FAMILY.)

Trees or shrubs with opposite simple or odd-pinnate *leaves* and perfect and complete or sometimes apetalous and dioecious *flowers*, in terminal and axillary racemes or panicles. *Calyx* 4-lobed or 4-toothed, mostly persistent, rarely obsolete. *Corolla* 4-cleft, or of 4 distinct petals—sometimes wanting: aestivation mostly valvate. *Stamens* usually 2. *Fruit* various—baccate, drupaceous, capsular or samaroid,—2-celled, and by abortion often 1-celled and 1-2-seeded. *Seeds* pendulous, mostly albuminous.

A small but interesting Order. Olives and Olive oil are afforded by the genus (*Olea*) which is the type of the family,—the pericarp, instead of the seed, yielding the oil. The Manna of the shops is derived from a species of Ash.

FIG. 11. A branch of *Enslenia albida*.

1. SYRIN'GA, L. LILAC.

[From the Latin, *Syrinx*, a pipe ; from the straight branches filled with pith.]

Calyx 4-toothed, persistent. *Corolla* salver-shaped, with a tube much longer than the calyx ; *limb* 4-parted. *Stamens* 2. *Capsule* ovate-lanceolate, compressed, 2-celled, 4-seeded. *Seeds* narrowly winged ; *albumen* fleshy. *Shrubs* with the terminal buds in pairs, opposite, entire, petioled leaves, and lilac or white flowers in thick panicles.

1. *S. VULGA'RIS*, L. Leaves cordate, smooth ; limb of the corolla somewhat concave.

COMMON SYRINGA. Lilac.

Cultivated. Native of Persia, Hungary, &c. May - June.

Obs. This, one of the commonest ornamental shrubs, is frequently seen in old gardens, forming dense clumps 10 - 20 feet high. It throws up suckers abundantly from the root, and by this means is easily propagated. There are several well-marked varieties, differing in the compactness of the flower clusters and the color of the flowers, which vary from deep purple to white. *

2. *S. PER'SICA*, L. Leaves lanceolate, acute, frequently divided or pinnatifid ; limb of corolla flattish.

PERSIAN SYRINGA. Persian Lilac.

Cultivated. Native of Persia.

Obs. A much more delicate species than the common Lilac, growing to the height of 6 - 8 feet. There are two forms, one with entire leaves (*var. INTEGRIFOLIA*), and the other (*var. LACINIATA*) with the leaves, even on the same branch, presenting all the forms between perfectly entire and pinnately divided ; a most interesting illustration of the true nature of pinnatifid leaves. The flower-clusters in both varieties are more slender than those of the preceding species. *

2. LIGUS'TRUM, Tournef. PRIVET.

[The Latin classical name.]

Calyx with a short tube, 4-toothed, deciduous. *Corolla* funnel-form, the limb 4-parted ; lobes ovate, obtuse. *Stamens* 2, inserted on the tube of the corolla, included. *Style* very short ; *stigma* bifid, obtuse. *Berry* globose, 2-celled ; cells 2- (or by abortion 1-) seeded. *Shrubs*. *Leaves* opposite, simple, entire. *Flowers* in terminal thyrsoid panicles.

1. *L. VULGA'RE*, L. Leaves elliptic-lanceolate, acute or obtuse, mucronulate, glabrous ; panicle compound, contracted.

COMMON LIGUSTRUM. Privet. Prim.

Fr. Le Troène. *Germ.* Die Gemeine Rheinweide. *Span.* Alhena.

Stem 6 - 8 or 10 feet high, much branched ; branches opposite. *Leaves* 1 - 3 inches long, varying from lanceolate and acute, to elliptic or oblanceolate and obtuse, on short petioles. *Corolla* white. *Berries* black (rarely greenish-white) when mature.

Way-sides, fence-rows, &c. ; introduced. Native of Europe. *Fl.* June. *Fr.* October

Obs. Introduced for the purpose of hedging, for which it is now used to a less extent than formerly. It has become completely naturalized, and is found plentifully in New England, New York and Pennsylvania. The European Olive (*Olea Europœa*) so valuable for its oil, belongs to this tribe. It grows and perfects its fruit in the grounds around the old Jesuit Missions in Southern California, and might doubtless be profitably cultivated in the Southern Atlantic States where there is a native species, *Olea Americana*, a small tree which has the popular name of "Devil-wood." *

3. CHIONAN'THUS, L. FRINGE-TREE.

[Greek, *chion*, snow, and *anthos*, a flower ; from its snow-white blossoms.]

Calyx very small, 4-parted, persistent. *Corolla* of 4 long linear *petals*, slightly connected at base. *Stamens* 2, (sometimes 3-4), very short. *Stigma* notched. *Drupe* fleshy, globular ; *nut* striate, 1-seeded ; *seed* without *albumen*. *Small trees* ; *buds* remarkably 4-cornered and pyramidal ; *leaves* entire ; *flowers* in loose pendulous trichotomous *racemes*.

1. *C. Virgi'nica*, L. Leaves oval or obovate lanceolate, sub-coriaceous, smoothish ; racemes terminal and axillary.

VIRGINIAN CHIONANTHUS. Fringe-tree.

Stem 10-20 feet high, with spreading branches. *Leaves* 4-6 inches long, acute at each end ; *petioles* about half an inch in length. *Racemes* 3-4 inches long, somewhat paniculate,—the terminal pedicels by threes. *Petals* white, nearly an inch long. *Drupe*s of a livid blackish color when mature.

Pennsylvania and southward. June.

Obs. The singular beauty of this ornamental little tree is beginning to be appreciated by our people ; and it is consequently making its appearance in the yards and lawns of all persons of taste. The mature fruit has a remarkably disagreeable bitterish taste.

4. FRAX'INUS, Tournef. ASH.

[The classical Latin name of the Ash.]

Flowers polygamous or (in our species) dioecious. *Calyx* small and 4-cleft, toothed, or entire or obsolete. *Corolla* of 2-4 oblong petals or (in the North American species) wholly wanting. *Stamens* 2, sometimes 3 or 4 ; *anthers* linear or oblong, large. *Style* single ; *stigma* 2-cleft. *Fruit* a 1 or 2-celled *samara* (key fruit), flattened, winged at the apex. *Trees*, with petioled pinnate *leaves* ; the small *flowers* in crowded panicles or racemes from the axils of last year's leaves.

* *Fruit* winged from the apex only, barely margined or terete towards the base ; *calyx* minute, persistent ; *leaflets* stalked.

1. *F. America'na*, L. Leaflets 7-9, petiolulate, ovate or lance-oblong, acuminate, entire or obsoletely dentate, glaucous beneath ; petioles and young branches terete, smooth ; buds with a rufous velvety pubescence ; panicles compound, loose, axillary ; samaras terete and margin-

less below, above extended into a lanceolate, oblanceolate or wedge-linear wing.

AMERICAN FRAXINUS. White Ash.

Stem 40–60 and 80 feet high, and 2–3 feet in diameter,—the young branches smooth and dotted with white specks. *Leaflets* 2–4 inches long,—at first downy, finally smooth and green above, pubescent and glaucous beneath. *Flowers* with a minute 3 or 4-toothed calyx. *Samara* terete at base, with a narrowish lance-oblong wing.

Woodlands : throughout the United States,—but particularly in the Northern States. *Fl.* May. *Fr.*

Obs. The timber of this tree is highly valuable, and much used by wheelwrights, coachmakers, &c. It also makes excellent fuel.

2. *F. pubes'cens*, Lam. Leaflets 7–9, petiolulate, elliptic-lanceolate, acuminate, subserrate ; petioles and young branches velvety-pubescent ; samaras linear-lanceolate.

PUBESCENT FRAXINUS. Red Ash.

Stem 30–50 or 60 feet high, and 12–18 inches in diameter. *Leaflets* 2–3 inches long,—more lanceolate and narrower than in the preceding—more pubescent beneath—and the petiolules shorter. *Samaras* acute at the base, flattish and 2-edged, the edges gradually dilated into the long oblanceolate or linear-lanceolate wing.

Low grounds, along streams : throughout the United States. *Fl.* May. *Fr.*

Obs. This has considerable resemblance to the preceding species ; but, besides the pubescence of the young branches, it is a smaller and less valuable tree.

3. *F. vir'idis*, Mx. f. Glabrous throughout ; leaflets 5–9, ovate or oblong-lanceolate, often wedge-shaped at the base and serrate above, bright green on both sides ; fruit acute at the base, striate, 2-edged or margined.

GREEN FAGUS. Green Ash.

Small or middle-sized tree.

Along streams : New England to Wisconsin and southward.

**** *Fruit winged all round the seed-bearing portion ; calyx wanting, at least in the fertile flowers, which are entirely naked.***

4. *F. sambucifo'lia*, Lam. Leaflets 7–11, sessile, ovate-lanceolate, acuminate, serrate, somewhat rounded and unequal at base, hirsutely bearded beneath on the midrib and in the angles of the nerves ; flowers naked ; samaras oblong, obtuse at each end.

SAMBUCCUS-LEAVED FRAXINUS. Black Ash. Water Ash.

Stem 30–40 or 50 feet high, and 12–18 inches in diameter ; young branches glabrous, green, sprinkled with black elliptic dots or warts. *Leaflets* 3–4 inches long, rugose and shining above, with tufts of tawny pubescence in the angles of the nerves beneath. *Samaras* broadish, of nearly uniform width.

Low grounds, along rivulets, &c. : Northern and Middle States. *Fl.* April. *Fr.*

Obs. The wood is very tough and easily separable into layers which are used for making baskets, chair-bottoms, &c. There are several other species in the Southern and Western States, but I have not judged it expedient to swell the work by a particular notice of them.

DIVISION III.

APET'ALOUS EX'OGENS.

COROLLA none; the floral envelopes being in a single series (calyx), or sometimes wanting altogether.

ORDER LVI. ARISTOLOCHIA'CEÆ. (BIRTHWORT FAMILY.)

Herbs or shrubby plants,—sometimes nearly *stemless*, sometimes *twining* and *climbing*; *leaves* alternate, simple, entire, more or less cordate at base, petiolate, often with leaf-like *stipules*; *calyx-tube* more or less coherent with the ovary,—the *border* mostly 3-lobed, valvate in the bud; *stamens* 6–12, more or less united with the style; *anthers* adnate, extrorse; *ovary* mostly 6-celled; *fruit* a many-seeded 6-celled pod or berry; *seeds* with a large *raphe* and a minute *embryo* in a fleshy *albumen*.

1. ARISTOLO'CHIA, *Tournef.* BIRTHWORT.

[A Greek name,—having reference to the medical virtues of the plant.]

Calyx colored, tubular,—the lower portion adherent to the ovary, ventricose above the ovary, straight or curved; limb oblique, 2–3-lobed,—the lower lobe somewhat ligulate or extended to a lip. *Stamens* 6; the sessile *anthers* wholly adnate to the back of the short and fleshy 3–6-lobed or angled *stigma*. Capsule naked, 6-valved. Erect or twining *perennials* with lateral or axillary greenish or lurid-purple flowers. Capsule coriaceous, 6-celled, septically 6-valved. *Seeds* numerous

1. A. Serpenta'ria, L. Stem erect or ascending, flexuose; leaves lance-oblong, acuminate, entire, cordate (and sometimes auriculate) at base; peduncle sub-radical; calyx-tube much bent.

SNAKE-ROOT ARISTOLOCHIA. Virginia Snake-root.

Root perennial, of numerous rather coarse fibres. *Stem* herbaceous, 9–15 inches high, simple or branched from the base, slender, angular, pubescent, leafy above, nearly naked or with small abortive leaves below. *Leaves* 2–4 or 5 inches long; *petioles* one-fourth of an inch to near an inch long. *Flowers* rather large, few or solitary, near the base of the stem, and often concealed beneath dead leaves, on a flexuose bracteate *peduncle* 1–2 inches in length. *Calyx* a dull purplish brown, subcoriaceous, angularly bent, gibbous at the angle,—the limb dilated and somewhat 3-lobed. *Capsule* turbinate or roundish-obovoid, somewhat fleshy, pubescent.

Rich woodlands: throughout the United States. *Fl.* June. *Fr.* July–August.

Obs. This little plant is to be found in almost every woodland, where the soil is good; and its medicinal value, as an aromatic stimulant, renders it desirable that every person should know or be enabled to recognize it. For this reason I have been induced to give it a place here.

Another species **A. Sipho, L'Her.**, the Pipe Vine, or Dutchman's Pipe, is a native of the West and South. It is a tall climber, and is often cultivated as an ornamental vine. Its singularly curved flowers, resembling a Dutch Pipe, are very interesting and curious, but the



coarseness of its foliage—the full-grown leaves being a foot in breadth, renders it less beautiful than many others of our native climbers.

The Canada Snake-root, or Wild Ginger, *Asarum Canadense*, L., belongs to this family; it is common in rich woodlands, and is readily recognized by having a single pair of broad kidney-shaped leaves, and a single large brownish-purple flower borne in the fork of the long petioles. The root, or, more properly, root-stock, is highly pungent and aromatic; it is largely collected to supply the drug trade; its taste somewhat resembles that of ginger, and it is used as a substitute for it in some parts of the country. *

FIG. 172. Virginia Snakeroot (*Aristolochia Serpentaria*). a. A pod.

ORDER LVII. PHYTOLACCA'CEÆ. (POKEWEED FAMILY.)

Herbs or suffruticose plants, having alternate entire leaves without stipules, and racemed flowers of 4-5 petaloid slightly connected sepals, with as many or twice as many stamens, or sometimes indefinite. Ovary compound (rarely simple), consisting of 10 confluent 1-ovuled carpels; styles or stigmas distinct. Fruit baccate; embryo curved round mealy albumen.

A small Order, and of little interest in Agriculture.

1. PHYTOLAC'CA, *Tournef.* POKEWEED.

[Gr. *Phyton*, a plant, and *Lachanon*, a pot-herb; the young shoots being so used.]

Flowers perfect. *Calyx* of five roundish-ovate, petal-like, persistent sepals. *Stamens* 5-30. *Ovary* free, composed of 5-12 carpels united in a ring, with as many short separate *styles*, in *fruit* forming a depressed-globose 5-12-celled berry with a single vertical *seed* in each cell.

1. *P. decan'dra*, *L.* Stout; smooth and often purple; leaves ovate-oblong; berries 10-celled, juicy, dark-purple.

DECANDROUS PHYTOLACCA. Poke. Poke-weed. Pigeon-berry. Garget.

Fr. Morelle à Grappes. *Germ.* Kermesbeere. *Span.* Yerba carmin.

Root perennial, large, fusiform and branching. *Stem* herbaceous, 4-6 feet high, stout, branching, terete or obtusely ribbed below the petioles and branches, finally purple. *Leaves* 5-10 inches long, acute or acuminate, thin; *petioles* half an inch to 2 inches or more in length. *Racemes* 3-6 inches long, simple, mostly opposite the leaves, on angular *peduncles* 2-4 inches long. *Sepals* white, membranaceous at the margin. *Berries* vertically depressed, umbilicate, orbicular, obscurely ribbed, 10-celled, 10-seeded, dark purple and juicy when mature. *Seeds* compressed, roundish-reniform.

Rich soils; on banks, borders of fields, in clearings, &c.: throughout the United States. *Fl.* June-September. *Fr.* August-October.

Obs. The young shoots of this plant afford a good substitute for Asparagus; the root is said to be actively emetic; and the tincture of the ripe berries is, or was, a popular remedy for chronic rheumatism. The mature berries, moreover, have been used by the pastry cook in making pies of equivocal merit. Notwithstanding all this, the plant is regarded and treated as a weed by all neat farmers.

ORDER LVIII. CHENOPODIA'CEÆ. (GOOSEFOOT FAMILY.)

Chiefly coarse weed-like *herbs*, with mostly alternate, more or less fleshy *leaves*, without *stipules*; *flowers* minute, greenish, without scarious *bracts*,—often dioecious or polygamous; *calyx* free from the ovary, 2-5-lobed, imbricated in the bud, persistent, embracing the fruit; *stamens* usually as many as the calyx-lobes, and opposite them; *ovary* 1-celled, becoming a thin 1-seeded *utricle*, or rarely *akene* in fruit; *embryo* (in the genera noticed here) coiled in a ring around the mealy albumen.

§ 1. Flowers mostly perfect, or merely polygamous by the want of stamens in some of them.

Calyx 3-5 cleft, or parted, the lobes merely keeled in fruit. Seed horizontal (rarely vertical when the calyx is only 2-3-cleft).

Calyx 5 cleft, the base indurated and corky in fruit. Seed horizontal.

Calyx of 3-5 sepals, dry or juicy in fruit. *Utricle* membranaceous. Seed vertical.

§ 2. Flowers dioecious.

Calyx of fertile flower, inflated-tubular, unequally 2-4-toothed.

1. CHENOPODIUM.

2. BETA.

3. BLITUM.

4. SPINACIA.

1. CHENOPO'DIUM, L. GOOSEFOOT.

[Gr. *Chen*, a goose, and *Pous*, *podos*, a foot ; in allusion to the form of the leaves.]

Flowers perfect. *Calyx* 5-cleft, rarely 2-4-cleft or parted, with the lobes sometimes keeled, but not appendaged nor becoming succulent, more or less enveloping the depressed fruit. *Stamens* mostly 5 ; filament filiform. *Styles* 2, rarely 3. *Seed* horizontal (sometimes vertical in No. 3.), lenticular ; *embryo* partially or fully coiled round the mealy *albumen*. *Weeds*, mostly *annuals*, usually with a white *mealiness* or *glandular*. *Flowers* sessile in small clusters collected in *spiked panicles*, blooming throughout the summer.

* *Leaves strongly and sharply-toothed* (*mealiness* obscure or none), *on slender petioles* ; *calyx-lobes slightly keeled*.

1. *C. hy'bridum*, L. Leaves green on both sides, cordate-ovate, acuminate, angularly and remotely dentate ; racemes loosely paniculate, leafless.

HYBRID CHENOPODIUM. Maple-leaved Goosefoot.

Stem 2-4 feet high, rather slender, angular and striate, much branched. *Leaves* 2-4 inches long, thin, bright green ; *petioles* 1-2 inches in length. *Flowers* paniculate,—the sub-divisions cymose ; terminal *panicle* long and loose, with divaricate branches. The smooth *calyx-lobes* keeled. *Seed* sharp-edged, the thin pericarp adhering closely to it.

About dwellings and along streams : common. Native of Europe. June - August.

Obs. A common weed with a heavy odor, like that of Stramonium.

** *Leaves toothed, repand-angled, or sometimes nearly entire, more or less white-mealy as well as the flowers* ; *calyx-lobes distinctly keeled*.

2. *C. al'bum*, L. Leaves rhomboid-ovate, erose-dentate, entire and tapering towards the base,—the upper ones oblong-lanceolate, entire ; racemes erect, branched, somewhat leafy.

WHITE CHENOPODIUM. Lamb's Quarters. Goosefoot.

Fr. Anserine blanche. *Germ.* Der Gaensefuss.

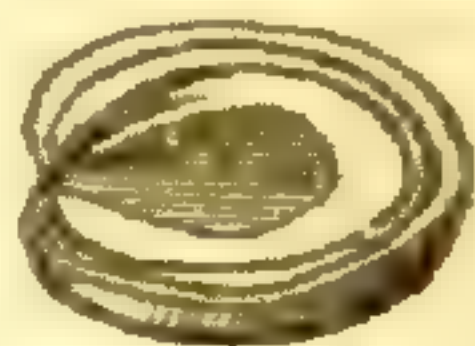
Root annual. *Stem* 3-5 or 6 feet high, rather stout, angular, often striped with yellow and green, sometimes purplish, branched. *Leaves* 1-3 inches long, covered with very minute flat or cup-like scales (especially on the under surface), which give them a glaucous or mealy appearance ; *petioles* 1-2 or 3 inches long. *Flowers* in pulverulent clusters. *Calyx* depressed, 5-angled by the prominent keels of the incurved segments, greenish and glaucous. *Seed* dark purple or nearly black, lenticular, smooth and shining.



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FIG 173. An enlarged flower of the Common Goosefoot (*Chenopodium album*.) 174. The same divided. 175. A section through the seed, showing the coiled embryo outside the albumen.

Gardens, yards, and waste places : introduced. Native of Europe. *Fl.* July - August. *Fr.* Oct.

Obs. This coarse and rather homely weed has become very extensively naturalized throughout the United States, and is quite troublesome in gardens. The young plant is sometimes used as a pot-herb, but would be gladly dispensed with by all neat gardeners and farmers.

*** *More or less viscid glandular, with a strong balsamic odor, not mealy ; embryo not forming a complete ring.*

3. *C. ambrosioides*, L. Leaves oblong, acute at each end, remotely dentate ; racemes interrupted, leafy.

AMBROSIA-LIKE CHENOPODIUM. Mexican Tea.

Annual. Stem 1-2 feet high, much branched, angular. Leaves 1-2 inches long,—those on the stem narrowed to a petiole, those on the branches and racemes lance-linear, mostly entire, subsessile. Flowers in interrupted sessile clusters, on slender axillary leafy branches.

Var. anthelminticum, Gray. *Perennial* (?). Leaves more strongly toothed, the lower sometimes almost lacinate pinnatifid. Spikes mostly leafless.

Naturalized from tropical America.

Obs. Most authors consider *C. ambrosioides* and *C. anthelmin'ticum* as distinct species ; we follow GRAY in placing the latter as a variety of the former. Both forms are common in waste places, especially southward ; they have both a strong odor which is most powerful and disagreeable in the var. *anthelmin'ticum*, which is popularly known as Worm-seed. The whole plant contains a volatile oil to which the odor is due. This is most abundant in the seed, or rather in the utricle which surrounds it. The seeds themselves, and the oil which they yield are well-known and effective worm-destroying medicines.

There are several other species of this genus to be met with, especially near the coast, but they are not sufficiently common to be admitted here. *

2. BE'TA, Tournef. BEET.

[Celtic, *Bett*, red ; or from its fruit resembling the Greek letter B (*Beta*).]

Calyx urceolate, 5-cleft, finally indurated at base—the lobes remaining unchanged. *Ovary* depressed ; *stigmas* 2. *Utricle* immersed in the base of the calyx and covered by the lobes. *Seed* horizontal. *Herbaceous*, with a large fleshy root formed of concentric zones. *Flowers* glomerate in spikes or paniculate racemes.

1. *B. vulga'ris*, L. Smoothish ; greenish purple ; lower leaves ovate-oblong, wavy ; upper ones lance-ovate ; flowers in dense sessile axillary clusters, interruptedly spicate.

COMMON BETA. Beet. Garden-beet. Sugar-beet.

Fr. Bette-rave. *Germ.* Gemeiner Mangold. *Span.* Acélga.

Root biennial, fleshy, large (often 3-4 inches in diameter and more than a foot long) terete, tapering downwards, deep purple or yellowish—exhibiting, on a transverse section, concentric layers, which seem to have some relation to the number and size or vigor of



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the radical leaves—perhaps severally formed and nourished by them. *Stem* 2-4 feet high, sulcate-angled, somewhat paniculately branching. *Radical-leaves* 6-12 inches long; *petioles* 4-8 inches long, succulent, channeled above; *stem-leaves* lance-ovate, acute, petiolate, smaller as they ascend. *Calyx* purplish-brown, fleshy at base, finally indurated or externally corky—the *segments* keeled, incurved and subsaccate at apex. *Seed* depressed, cochleate-orbicular, loosely farinaceous, enveloped in a purple membrane and lodged in a bony cell at the base of the calyx.

Gardens and lots : cultivated. Native of Southern Europe. *Fl.* July. *Fr.* September.

FIG. 176. Summit of a branch of Wormseed (*Chenopodium ambrosioides*, var. *anthelminticum*).

Obs. Very generally cultivated for its fine esculent root—of which there are several varieties. That one called “Sugar-beet”—with a pale, yellowish root—is extensively cultivated, on the continent of Europe, for the purpose of making sugar,—and has been partially tried in this country: but while we have the Sugar-maple and Sugar-cane to supply us, it is not probable the Beet will be much relied upon, for that object. A large rooted variety of *B. Cicla*, *L.* (a nearly allied species), called Mangel Wurtzel, or Scarcity Root, is sometimes cultivated for stock,—and is probably entitled to more attention than it has yet received from our farmers—who are not generally partial to the culture of root crops.

3. BLITUM, *Tournef.* BLITE.

[The ancient Greek and Latin name of some pot-herb.]

Calyx 3–5-parted, either unchanged or (in the species here noticed) becoming *berry-like* in fruit, not appendaged. *Stamens* 1–5; *filaments* filiform. *Styles*, or stigmas, 2. *Seed* vertical, compressed globular; the *embryo* coiled into a ring quite around the albumen. *Hersb* with petioled triangular, or halberd-shaped, and mostly sinuate-toothed *leaves*.

1. *B. capita'tum*, *L.* Stem ascending, branching; leaves triangular-hastate, acute, sinuately toothed; flowers interruptedly spiked; calyx pulpy and bright-red in fruit.

CLUSTERED BLITUM. Strawberry Blite.

Annual. *Stem* about a foot long, diffusely branched. *Flowers* in dense roundish clusters which are collected towards the summit of the branches.

On recently turned grounds and dry places, especially westward. June. Also a native of Europe.

Obs. We are not informed whether this is a troublesome weed, but as it is rather common in some places, and as it must, from the strawberry-like appearance of its ripe fruit, attract the notice of the observing farmer, we give it a place.

4. SPINA'CIA, *Tournef.* SPINACH.

[Latin, *Spina*, a thorn; the covering of the fruit being often prickly.]

FLOWERS DIÆCIOUS: STAM. FL. *Calyx* 4–5-parted,—the lobes equal. PISTILLATE FL. *Calyx* ventricose-tubular, 2–3-toothed. *Ovary* ovoid; *styles* 4, elongated, filiform. *Akene* included in the turgid indurated calyx, which is often 2–3-horned on the back. *Seed* vertical, compressed; *embryo* annular, surrounding the farinaceous albumen. *Herbaceous*: *flowers* axillary, glomerate,—the staminate ones in racemose-paniculate clusters.

1. *S. OLERA'CEA*, *Miller.* Leaves petiolate, hastate-lanceolate, often incised at base, or sagittate and entire.

POT-HERB SPINACIA. Spinach, or Spinage.

Fr. Epinard des potagers. *Germ.* Der Spinat. *Span.* Espinàca.

Root annual. *Stem* 18 inches – 2 feet high, somewhat branched, or often simple. *Leaves* 2 – 4 inches long, cuneately tapering to a *petiole* 1 – 3 or 4 inches in length. *Flowers* greenish. *Fruit* enclosed in the subglobose persistent calyx, which is scarcely cleft at maturity, and often not prickly in the variety usually cultivated.

Gardens : cultivated. Native of the east. *Fl.* June – July. *Fr.* Aug. – September.

Obs. This well-known pot-herb—said to have been first brought into Spain by the Arabs—is frequently found in gardens,—especially in the vicinity of our cities and market towns. The *Atriplex hortensis*, L., or Garden Orach, is another pot-herb, belonging to this tribe ; but I believe it is not much cultivated in the United States.

ORDER LIX. AMARANTA'CEÆ. (AMARANTH FAMILY.)

Weed-like *herbs* ; *characters* nearly as those of the preceding Order—but the *flowers* imbricated with dry scarious persistent *bracts*, which are usually colored, commonly 3 in number ; *calyx* of 3 – 5 *sepals*, dry scarious and persistent.

The plants of this Order are mostly natives of tropical countries, a number of them have become naturalized among us as weeds, while others are cultivated as ornamental plants. Among the best known of the latter are Love Lies Bleeding and Princes' Feather (both species of *AMARANTUS*), Coxcomb (*CELOSIA CRISTATU*), and the Globe Amaranth (*GOMPHRUM GLOBOSA*).

1. AMRAN'TUS, L. AMARANTH.

[Greek, *a*, not, *maraino*, to fade, and *anthos*, a flower ; the flowers not changing or fading.]

Flowers monœciously polygamous : *calyx* of 3 – 5 *sepals*, mostly colored, slightly connected at base. *Stamens* 3 – 5, free. *Stigmas* 2 – 3. The *fruit* an ovoid, 1-seeded membranaceous *utricle*, 2 – 3-beaked at the apex, mostly longer than the calyx, opening transversely all round,—the upper part falling away as a lid. *Embryo* coiled into a ring around the albumen. Coarse *annual* weeds, with minute *flowers* in axillary or terminal-spiked clusters.

* *Flowers in terminal and axillary, simple or mostly paniced spikes, green ; stem unarmed ; stamens and sepals 5.*

1. *A. hy'bridus*, L. Bracts awned, sometimes tinged reddish ; fruit 2 – 3-cleft at the apex, nearly smooth, not exceeding the calyx.

HYBRID AMARANTUS. Green Amaranth. Pigweed.

Leaves ovate-oblong or ovate, acute, smooth bright green. *Spikes* erect, obtuse, in loosely branched panicles, the terminal one longer.

2. *A. chlorosta'chys*, Willd. Bracts awn-pointed, rather longer than the calyx, which is shorter than the 2 – 3-toothed rugose fruit.

GREEN-SPIKED AMARANTUS.

Leaves bright deep green, long petioled, ovate or rhombic-ovate. *Spikes* ascending, acute crowded in an open panicle, the terminal one long and often nodding.

3. *A. retroflex'us*, L. Bracts pointed, twice the length of the calyx, which is longer than the rugose fruit.

REFLEXED AMARANTUS.

Roughish and pubescent. Leaves pale or dull green or rather glaucous, long-petioled



FIG. 177. *Amarantus retroflexus*.

ovate or rhombic-ovate, undulate. *Spikes* crowded in a stiff panicle, acutish, more or less spreading, green, the terminal one shortish and erect.

Obs. In the confusion which exists concerning this genus, we have adopted above the characters given by GRAY; they are probably, as he suggests, all forms of one species. They are natives of tropical America, and are exceedingly common about waste places and in cultivated soils, especially in the latter part of summer.

** *Flowers greenish; stem armed with spines borne in pairs in the axils of the leaves; stamens and sepals 5.*



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4 *A. spinosus*, L. Stem striate, smoothish, much branched; leaves ovate-lanceolate; axils spinose; flowers pentandrous, in compound terminal and axillary spikes.

FIG 178. The Thorny Amaranth (*Amarantus spinosus*), a branch.

THORNY AMARANTUS.

Root annual. *Stem* 18 inches – 2 or 3 feet high, often purple. *Leaves* 1–2 inches long, rather obtuse, mucronate, entire, roughish-dotted, with glaucous blotches beneath *petioles* about as long as the leaves, with 2 subulate spines at base, one fourth to half an inch in length. *Flowers* small, clustered in oblong terete, erect terminal and subterminal spikes.

Cultivated lots, way-sides and waste places : introduced. Native of India. *Fl.* August. *Fr.* October.

Obs. This foreigner is naturalized in many places—especially in the unfrequented streets and outskirts of our sea-port towns,—and is gradually extending itself into the country. It is a vile nuisance wherever it prevails, and cannot be too sedulously guarded against.

*** *Flowers in close and small axillary clusters ; stamens and sepals 3, or the former only 2.*

5. *A. al'bus*, L. Pale green and smooth, much branched ; leaves obovate and spatulate-oblong, emarginate, setaceously mucronate ; flowers triandrous, in small axillary clusters.

WHITE AMARANTUS.

Stem 1–2 or 3 feet high, rather stout, pale green or whitish, generally much branched—the principal branches near the base, spreading. *Leaves* half an inch to an inch and a half long, entire, narrowed at base to a slender *petiole*, one fourth of an inch to an inch and a half long. *Flowers* pale green, inconspicuous, in small axillary bracteate clusters ; *bracts* subulate-lanceolate, spinescently acuminate, longer than the flowers.

Barn-yards, cultivated fields, &c. *Fl.* August. *Fr.* September.

Obs. A worthless common weed, considered by some as a native of this country, but it has all the appearance of a naturalized plant, and probably came from tropical America.

ORDER LX. POLYGONA'CEÆ. (BUCKWHEAT FAMILY.)

Herbs with alternate, usually entire, leaves, with stipules cohering and forming *sheaths* (ochreae) around the stem above its swollen joints ; *flowers* generally perfect, with a more or less persistent 3–6-cleft *calyx* ; *stamens* 4–12 inserted on the base of the calyx ; *ovary* 1-celled, bearing 2–3 *styles*, becoming akene-like in *fruit*. *Seed* single, erect, straight, with the *embryo* curved or straightish, on the outside of the *albumen*, or rarely in its centre.

*Sepals mostly 5.

Embryo curved around one side of the albumen. Cotyledons slender or flat.

Embryo in the albumen. Cotyledons broad and twisted-plaited.

**Sepals 6.

Fruit 3-angled, wingless.

Fruit 3-angled, winged at the angles.

1. POLYGONUM.

2. FAGOPYRUM.

3. RUMEX.

4. RHEUM.

1. POLY'GONUM, L. KNOT-WEED.

[Greek, *Polys*, many, and *Gonu*, a knee or joint ; the stem being much jointed.]

Calyx often colored, embracing the fruit. *Stamens* 4–9, mostly 8. *Ovary* 1-celled, compressed or triquetrous ; *styles* 2–3, more or less united below. *Akenes* lenticular or triquetrous, according as the styles are 2 or 3 ; *embryo* in a groove of the *albumen*, and curved half way around it. *Flowers* often with sheathing *bracts* ; *pedicels* articulated.

‡ 1. *Stems more or less erect.*

* *Flowers in terminal racemes or spikes.*

† *Sheaths salver-form.*

1. *P. orienta'le*, L. Tall; hairy; leaves ovate-acuminate; sheaths salver-form, ciliate; stamens 7.

ORIENTAL POLYGONUM. Ragged Sailor. Prince's Feather.

Annual. Stem 4–8 feet high, paniculately branched above. Leaves 4–6 inches long, often subcordate at base; petioles 1–2 inches in length, somewhat winged by the decurrence of the leaves; stipules tubular with the border spreading or reflexed. Racemes numerous, 2–3 inches in length, nodding on hirsute peduncles. Flowers bright purple, rather large, crowded; pedicels rather longer than the ciliate sheathing bracts.

Gardens and waste grounds. Native of Asia. July–September.

Obs. This showy species is sometimes cultivated, and has become sparingly naturalized. JOHN BARTRAM probably refers to it, in a letter to Miss COLDEN, where he says: "The species of Persicary thee mentions, is what TOURNEFORT brought from the three churches at the foot of Mount Ararat."

†† *Sheaths cylindrical, not ciliate.*

2. *P. Pennsylvan'icum*, L. Leaves lanceolate; sheaths smooth, not ciliate; spikes oblong, somewhat nodding, on glandular-hispid peduncles; stamens 5–8.

PENNSYLVANIAN POLYGONUM.

Root annual. Stem 2–3 or 4 feet high, smooth below, geniculate, with tumid nodes, paniculately branched above,—the branches glandular-hispid. Leaves 3–6 inches long; petioles about half an inch long. Stipules scarious, not fringed at summit. Spikes numerous, rather large (1–2 inches long.) Flowers bright palish-purple or rose-colored, in crowded fascicles; pedicels rather longer than the sheathing bracts.

Moist grounds, waste places, &c.: throughout the United States. Fl. July–Aug. Fr. Sept.–Oct.

Obs. This has much general resemblance to the following—usually growing in company with it—and equally worthless. It is, however, a stouter plant, and readily distinguished by the characters above noted.

††† *Sheaths ciliate or fringed with bristles.*

3. *P. Persica'ria*, L. Leaves lanceolate, usually marked with a dark lunate or triangular spot near the middle; sheaths somewhat pilose, ciliate at summit; peduncles smooth; stamens 6.

PEACH-LEAVED POLYGONUM. Lady's thumb. Spotted Knot-weed.

Fr. Persicaire. Germ. Flöhkraut. Span. Persicaria.

Root annual. Stem 1–2 feet high, branching, smooth, often purplish. Leaves 2–4 inches long, tapering at base to a short petiole. Stipules truncate, fringed with bristles one-fourth to one-third their length. Spikes about an inch long. Sepals purple or bright crimson. Pedicels about as long as the bracts.

Waste places, road-sides, &c.: introduced. Native of Europe. Fl. Aug. Fr. Sept.–October.

Obs. A very common weed about farm houses, which should be kept in subjection by every neat farmer.



4. *P. Hydropiper*, L. Smooth, very acrid; leaves lanceolate, pellucid-dotted, wavy margined; sheaths ciliate with shortish bristles; racemes filiform, flaccid and nodding; fascicles few-flowered, rather distant; calyx glandular-dotted.

FIG. 179. The Pennsylvanian Polygonum (*P. Pennsylvanicum*.) 180. An enlarged flower, opened.

WATER-PEPPER POLYGONUM. Water-pepper. Smart-weed.

Annual. Stem 1–2 feet high, more or less branched, sometimes decumbent, often purplish. Leaves 2–4 inches long, acute at each end, sessile; sheaths tubular, somewhat inflated, hairy, fringed with bristles, $\frac{1}{2}$ – $\frac{2}{3}$ the length of the tube. Racemes 2–4 inches long, slender and interrupted, at first nodding, finally erect; fascicles 2–4-flowered; flowers greenish with white edges; pedicels proceeding from bristly-ciliate sheathing bracts. Styles 2–3. Achenium flattish or obtusely triangular.

Moist waste grounds: introduced from Europe. Aug. – Sept.

Obs. A worthless weed, as most of the species are; and it is, moreover, a highly acrid plant, sometimes causing obstinate ulcerative inflammation when incautiously applied to the skin. The medical men of the Middle Ages highly extolled it for its remedial qualities, but it is not used at present.

** Flowers axillary, 2–3 together.

5. *P. avicula're*, L. Stems procumbent or spreading; leaves sessile, lanceolate or oblong; sheaths lacerate; stamens 5–8; akenes triquetrous.

BIRD POLYGONUM. Knot-grass. Goose-grass. Door-weed.

Annual. Stem 6–12 inches long, much branched and spreading, smooth. Leaves $\frac{1}{2}$ an inch to an inch long. Stipules white. Flowers green, edged with white, and often tinged with purple, small, sessile. Fruit enclosed in the calyx, dull, minutely wrinkled or granular under a lens.

Yards and foot-paths. June – Aug.

Obs. This humble weed is thoroughly naturalized, and is one of the commonest everywhere about dwellings. There are several varieties, one of which, var. *erectum*, is quite common in rich shady places; its stems are nearly erect, 1–2 or 3 feet high, with oval leaves 1–2 inches in length.



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FIG. 181. A branch of the Halberd-leaved Tear-thumb (*Polygonum arifolium*.)

2. Stem weak, not twining but somewhat climbing or supported on other plants by means of the prickles on the angles of the stem and petioles.

6. *P. arifo'lium*, L. Leaves halberd-shaped, acuminate, on long petioles; clusters racemose, few-flowered; peduncles glandular-hispid; stamens 6; styles 2; fruit lenticular.

ARUM-LEAVED POLYGONUM. Halberd-leaved Tear-thumb.

Root annual. Stem 3-6 feet long, rather coarse, grooved-angled, branching, often purple. Leaves 2-5 inches long, and 1-3 inches wide,—the midrib and nerves hirsute; petioles half an inch to 3 inches long, retrorsely aculeate. Stipules ciliate. Calyx often of 4 connected sepals, purple, with the margins pale red.

Swampy low grounds, along rivulets, &c.: throughout the United States. Fl. Aug. Fr. Sept.

Obs. This and the following species often grow in company,—clambering over other plants, and forming entangled bunches. Both are worthless, unwelcome weeds, especially among the second crop of wet meadows. Ditching and draining are the remedies for the evil.

7. *P. sagitta'tum*, L. Leaves arrow-shaped, acute, on short petioles; clusters capitate; peduncles smooth; stamens 8; styles 3; fruit sharply 3-angled.

SAGITTATE POLYGONUM. Arrow-leaved Tear-thumb.

Root annual. Stem 2-4 feet long, slender, branching, acutely quadrangular. Leaves 1-3 inches long, and half an inch to an inch wide, sagittate at base,—the midrib and petiole retrorsely aculeate. Stipules smooth. Sepals pale red, with the margins nearly white.

Swampy meadows and thickets: New York to Florida. Fl. August. Fr. September.

Obs. Several other species of *Polygonum* are met with about our farms (descriptions of which may be found in the *Floras*),—but, as they are not particularly troublesome, they are omitted here.



FIG. 182. The Arrow-leaved Tear-thumb (*Polygonum sagittatum*).

2. FAGOPY'RUM, *Tournef.* BUCKWHEAT.

[So named from its fruit resembling that of the *Fagus*, or Beech.]

Calyx nearly equally 5-parted; lobes petal-like, withering and nearly unchanged in fruit. *Stamens* 8. *Styles* 3; *stigmas* capitate. *Akene* 3-sided, embraced at base by the persistent calyx; *embryo* large, in the centre of the albumen, which it divides into 2 parts; *cotyledons* broad, foliaceous, plicate and twisted. *Annuals* with stems finally purple, and white *flowers* fasciculate in paniculate racemes.

1. *F. ESCULEN'TUM*, *Moench.* Stem erect, paniculately branched, sulcate-angled, smoothish; leaves triangular-sagittate or subhastate, acute, petioled; racemes compound, terminal and axillary.

ESCULENT FAGOPYRUM. Buckwheat.

Fr. Blé Sarrasin. *Germ.* Der Buchweizen. *Span.* Trigo Sarraceno.

Stem 2–4 feet high, much branched. *Leaves* 2–3 or 4 inches long, and 1–2 inches wide, often a little hastate at base, on *petioles* 1–2 or 3 inches long; *stipules* short, smooth. *Flowers* in somewhat paniculate racemes,—the fascicles rather crowded; *pedicels* slender, longish, obscurely articulated above the middle. *Sepals* mostly white, with tinges of green and pale purple. *Akenes* equally and acutely triquetrous, somewhat acuminate, much longer than the withered sepals, smooth, dark brown when mature, often striately clouded.

Fields: cultivated. Native of Middle Asia. *Fl.* Aug. *Fr.* Sept. – Oct.

Obs. This is extensively cultivated for its seeds,—the farinaceous albumen of which affords a delicious article of food, when properly managed,—and a very sorry one, if unskillfully treated. The glandular flowers are a favorite resort—and afford a rich reward to the labors—of the Honey-Bee. This is considered one of the most valuable plants for plowing in—it growing very rapidly, and succeeding on very poor soils. It readily escapes from culture, and has become naturalized.

3. RU'MEX, *L.* DOCK.

[The ancient Latin name, of unknown derivation.]

Flowers sometimes dioecious. *Calyx* of 6 sepals; the 3 outer sometimes united at base, spreading in fruit: the 3 inner ones larger (*valves*) increasing after flowering, often bearing a grain-like *tubercle* on the back. *Stamens* 6. *Styles* 3; *stigmas* pencil-tufted. *Akene* 3-angled, wingless. *Embryo* slightly curved, lying along one side of the albumen. Coarse *perennials* with *petioles* somewhat sheathing at base, and small, mostly green *flowers*, verticillate in paniculate racemes.

‡ 1. *Flowers* perfect: *herbage* bitter.

* *Inner sepals* entire, and all graniferous.

1. *R. cris'pus*, *L.* Radical leaves oblong-lanceolate, mostly acute, curled or wavy on the margin; inner sepals large, cordate; verticils crowded.

CURLED RUMEX Sour Dock. Curled Dock. Narrow Dock.

Fr. Patience frisée. Germ. Krauser Ampfer.

Root rather large, fusiform, yellow. Stem 2-3 or 4 feet high, angular-sulcate, smoothish, paniculately branched above. Radical leaves 8-12 or 15 inches long, and 1-2 or 3 inches wide; petioles 2-4 inches long; the stem leaves smaller, linear-lanceolate. Flowers in crowded verticillate fascicles, with scarious involucre at base. Calyx green; inner sepals much larger than the outer ones, entire or obsoletely denticulate near the base,—each with an ovoid acuminate excrescence, or grain, on the back.

Moist grounds; meadows, &c.: introduced. Native of Europe. Fl. May-July. Fr. July-September.

Obs. The radical leaves of this are often used as a pot-herb, or early “greens;” but the plant is an unsightly and troublesome weed,—and has become so extensively naturalized as to require a vigilant attention to keep it in due subjection.

** Inner sepals dentate,—one principally graniferous.

2. *R. obtusifolius*, L. Radical leaves subcordate-oblong, obtuse, crenulate; verticils loose and rather distant.

OBTUSE-LEAVED RUMEX. Bitter Dock. Broad-leaved Dock.

Root thickish, branching, brown externally, yellow within. Stem 2-4 feet high, angular-sulcate, roughish, paniculately branched. Radical leaves 8-12 inches long, and 4-6 inches wide; petioles 3-6 inches long. Flowers in interrupted verticillate fascicles. Calyx green,—the inner sepals with long acute teeth near the base, and one of them bearing a large grain on the back.

Grass lots; gardens, meadows, &c.: introduced. Native of Europe. Fl. June-July. Fr. August-September.

Obs. This species is even more worthless than the preceding; but—although completely naturalized—it is not quite so prevalent. The presence of either imparts a very slovenly appearance to a meadow or pasture lot.

‡ 2. *Flowers diœcious: herbage acid.*

3. *R. ACETOS'ELLA*, L. Leaves lanceolate-hastate,—the lobes acute, spreading; inner sepals entire.

Sheep Sorrel. Field Sorrel.

Fr. Petite Oscille. *Germ.* Der Sauer Ampfer. *Span.* Acederilla.

Stem 6-12 or 15 inches high, slender, branching, somewhat angular and furrowed. Leaves 1-2 inches long,—the lower ones mostly all hastate and on petioles as long or longer than the leaves—the upper ones on short petioles, and sometimes not hastate. Flowers in paniculate racemes, finally becoming purple,—the verticils 6-8-flowered. Pistillate plants mostly taller than the staminate.

Sandy fields and pastures; about old stumps, &c.: introduced. Native of Europe. Fl. May. Fr. August.

Obs. This little species (well known for its acidity,) is often so abundant as to be a nuisance on the farm. Improving the land—especially by adequate dressings of Lime—is believed to be the best mode of expelling this, as well as many other obnoxious plants.

4. RHE'UM, L. RRUBARB.

[From *Rha*, the ancient name of the river Volga,—its native region.]

Calyx of 6 sepals, in a double series, persistent and shrivelling. Stamens 9, arranged in pairs opposite the outer sepals, and singly opposite the

inner ones. *Styles* 3, short; *stigmas* large, multifid. *Akene* triquetrous, winged at the angles, surrounded at base by the withered calyx. *Herbaceous*: *leaves* chiefly radical, large; *flowers* fasciculate, racemose-paniculate.

1. *R. RHAPON'TICUM*, *Ait.* Leaves cordate-ovate, rather obtuse,—the sinus at base dilated; petioles with a shallow channel above, rounded at the edges.

RHAPONTIC RHEUM. Rhubark. Pie Rhubarb.

Root perennial, tuberous, large, reddish-brown, yellow within. *Stem* 3–5 feet high, stout, striate-sulcate, smoothish, fistular, paniculately branched at summit. *Radical leaves* becoming very large (18 inches to 2 feet long), smoothish above, pubescent on the veins beneath; *petioles* thick and succulent, 4–8 or 10 inches long,—the *stem-leaves* smaller, and petioles shorter, as they ascend; *stipules* large, membranaceous, sheathing. *Flowers* in large terminal racemose panicles,—the *pedicels* fasciculate, slender, one-third to half an inch long, articulated near the middle. *Sepals* greenish, with white margins,—the outer ones rather narrow. *Stigmas* large, multifid, reflexed.

Gardens: cultivated. Native of Scythia. *Fl.* May. *Fr.* July–August.

Obs. Frequently cultivated for the sake of its fleshy acid petioles—which are used by the pastry cook, in early spring, as a substitute for fruit, in making pies. The root of other species affords the medicinal Rhubarb, and this species is cultivated in England for its roots, which form an inferior kind of the drug.

ORDER LXI. LAURA'CEÆ. (LAUREL FAMILY.)

Aromatic trees or shrubs with alternate simple *leaves*, without *stipules*, and clustered often polygamo-dicecious *flowers*; *calyx* of 4–6 colored sepals, imbricated in two rows in the bud; *stamens* definite, usually more numerous than the sepals; *anthers* 2–4 celled, opening by uplifted persistent valves; *style* single; *fruit* a 1-seeded berry or drupe. *Seed* suspended, without *albumen*.

The tropical plants of this Order are highly interesting,—affording Cinnamon, Cassia and Camphor; and also that species of *Laurus* (*L. nobilis*, L.) of which the ancients formed their Laurel wreaths or crowns. The species in the United States are of less importance.

1. SAS'SAFRAS, *Nees.* SASSAFRAS.

[Altered from *Salsafra*, the Spanish name.]

Flowers dicecious. *Sepals* 6, membranaceous, united at base, persistent. *STAM. FL.* *Stamens* 9, in three series, all fertile,—the 3 innermost with a pair of stipitate glands at base; *anthers* introrse, linear, 4-celled. *PISTILLATE FL.* *Stamens* 6, all sterile. *Berry* on a thickened clavate fleshy pedicel. *Trees* with leaves often lobed but the margins entire, and greenish yellow flowers in corymbose racemes, appearing with the leaves.

1. *S. officina'le*, *Nees.* Leaves ovate or some of them 3-lobed and cuneate at base; drupe dark blue; peduncle purple.

OFFICINAL SASSAFRAS. Sassafras.

Stem 15–40 or 50 feet high, and 6–12 inches (in some rare instances, near 2 feet) in diameter, branching,—the young branches yellowish and pubescent. *Leaves* 3–5 inches long, and 2–4 inches wide,—silky-pubescent when young, finally smooth; *petioles* half an inch to an inch long. *Flowers* from the same buds, and contemporaneous with the leaves. *Sepals* oblong, rather obtuse, pale, greenish-yellow. *Berries* ovoid-oblong. Woodlands; fence-rows and old fields: Canada to Florida. *Fl.* April. *Fr.* September.

Obs. The bark of this well-known small tree is a powerful, yet pleasant, aromatic stimulant, and possesses valuable medicinal properties; which acquired for it, at an early day, in Europe, an exaggerated reputation. An infusion of the roots, or bark of the roots, makes an excellent diet drink. The pith of the young branches contains much mucilage, and is used to make a wash for inflamed eyes. We learn, also, from MICHAUX'S *Sylva*, that bedsteads made of the wood “are never infested with insects;” which circumstance—to adopt the language of the *Gazettes*—is certainly “important, if true,”—and well worthy of notice.

2. BENZO'IN, *Nees*. FEVER-BUSH.

[A name said to be derived from the Arabic,—expressive of *perfume*.]

Flowers polygamo-dioecious. *Sepals* 6, connected at base. *STAM. FL.* *Stamens* 9, in three series,—the innermost lobed at the summit, and gland-bearing at the base; *anthers* 2-celled. *PISTILLATE FL.*, with 15–18 alternating filiform and spatulate rudiments of stamens. *Drupe* oval; *peduncle* not clavate. *Shrubs* with yellow flowers in small lateral fascicles (which are surrounded by a deciduous involucre), appearing before the leaves.

1. B. odoriferum, *Nees*. Leaves obovate-oblong, mostly acute, often cuneate at base; drupe red, or finally dark purple.

ODORIFEROUS BENZOIN. Spice-wood. Wild Allspice. Fever-bush.

Stem 6–8 or 10 feet high; branches virgate, brittle. *Leaves* 2–4 inches long, mostly acute or with a short acumination (sometimes obtuse and rounded at apex); *petioles* about half an inch long. *Flowers* in involucrate clusters of 3–5 from a bud, on pedicels 1–2 lines long; flower-buds distinct from the leaf-buds,—usually a flower-bud on each side of the leaf-bud. *Sepals* greenish-yellow, obovate-oblong, obtuse.

Moist rich low grounds; borders of thickets, &c. Canada to Florida. *Fl.* April. *Fr.* September.

Obs. This is a strongly aromatic shrub. In early times—before Physicians were so numerous—an infusion of the brittle spicy twigs was much used as a popular remedy, and even as a preventive, of the fevers which attacked the first settlers; but it is now chiefly prescribed as a diet-drink for sickly cows, in the spring of the year.

ORDER LXII. LORANTHA'CEÆ. (MISTLETOE FAMILY.)

Shrubby plants parasitic on trees, having mostly opposite entire thick leaves without stipules and monœcious or dioecious flowers in short catkin-like jointed spikes. *Calyx-tube* (of the fertile flowers) adherent to the ovary; border obsolete or 3–4-toothed. *Stamens* as many as the calyx-lobes. *Fruit* a 1-seeded berry. *Embryo* small in mucilaginous albumen. Chiefly tropical plants. The Mistletoe of Europe is *Viscum album*.

1. PHORADEN'DRON, Nutt. MISTLETOE.

[Greek, *phor*, a thief, and *dendron*, tree ; because they steal their food from the trees they grow upon.]

Flowers diœcious, usually several under each short and fleshy bract or scale, and sunk in the joint. *Calyx* globular, 3- (rarely 2-4-) lobed. STAMINATE FL. with a sessile *anther* at the base of each lobe, transversely 2-celled. *Stigma* sessile. *Berry* globular, 1-seeded, with a gummy viscid pulp. *Stem* and branches jointed ; *flowers* greenish, in short axillary spikes.

1. *P. flaves'cens*, Nutt. Leaves elliptic-obovate, obtuse, somewhat longer than the spikes in their axils, somewhat petioled, yellowish-green ; berries pearly-white.

YELLOWISH PHORADENDRON. Mistletoe. False Mistletoe.

Stem 9-18 inches high, terete, much branched ; branches opposite. *Leaves* $\frac{3}{4}$ -1 $\frac{1}{2}$ inch long, 3-nerved beneath, smooth, fleshy or somewhat leathrey, narrowed at base to a thickish terete petiole 1-2 lines in length. *Flowers* small.

Branches of trees ; New Jersey, South and West. April.

Obs. This well-known parasite, feeding as it does at the expense of the trees upon which it fastens itself, is in some places so abundant as to be injurious to valuable forest trees. In some parts of the West it proves very troublesome. Doct. Short writes that the severe winters of the few years just past had killed it out in Kentucky ; but that now it is again overrunning the Elms, Hickories, Wild Cherries, &c., of that region. *

ORDER LXIII. EUPHORBIA'CEÆ. (SPURGE FAMILY.)

Plants usually with an acrid milky juice, mostly simple leaves, with small and deciduous stipules or none, and various, usually monoœcious or diœcious *flowers* ; the fruit of 2-3 or several 1-2 seeded pods united around a central axis, separating when ripe. *Seed* suspended ; *embryo* in fleshy albumen. *Stigmas* 2-3 or more, often forked. *Calyx* usually valvate in the bud, sometimes wanting. *Petals* sometimes present.

This large and varied—yet essentially natural Family—comprises upwards of 100 genera,—many of them possessing very active properties, or otherwise curious and interesting. Of these may be mentioned, the *Croton Tiglium*, L., which yields the powerful Croton Oil or Oil of Tiglium,—the *Jatropha Manihot*, L., which affords the Cassava and Tapioca,—the *Crozophora tinctoria*, Juss., yielding Turnsol,—the *Siphonia elastica*, Pers., affording the true Caoutchouc or Gum elastic,—the *Buxus sempervirens*, L., affording the beautiful Box-wood,—the *Hura crepitans*, L., or curious Sand-box tree, &c., &c.

1. EUPHOR'BIA, L. SPURGE.

[Named after *Euphorbus*, physician to King Juba of Mauritania.]

Flowers monoœcious, included in a cup-shaped 4-5-lobed involucre resembling a calyx or corolla, with glands at its sinuses. STAMINATE FL. numerous, lining the base of the involucre, each from the axil of a little bract, and consisting of a single *stamen* jointed on a pedicel ; *anther cells* globular, separate. PISTILLATE FL. solitary, in the middle of the involucre, soon protruded on a long *pedicel*, consisting of a naked 3-lobed, 3-celled ovary ; *styles* 3, bifid. *Capsule* separating into 3 *carpels* which

severally split elastically into 2 valves. *Seeds* 1 in each carpel. Polymorphous *herbs*, with an acrid milky juice; *peduncles* lateral or terminal, often in umbellate clusters.

§ 1. *Leaves* opposite, small, serrate, often hairy and falcate, furnished with awl-shaped or scaly stipules; *stems* much branched; *involucres* in the forks or axils; *seeds* transversely wrinkled-pitted; *annuals*.

1. *E. macula'ta*, L. Prostrate; peduncles equalling the petioles, crowded in lateral clusters; pod acutely angled, puberulent; seeds ash-colored, sharply 4-angled.

SPOTTED EUPHORBIA. Milk Purslane. Spotted Spurge.

Stem 6–12 inches long, much branched from the base and lying close to the ground. *Leaves* $\frac{1}{4}$ – $\frac{1}{2}$ an inch long, very oblique at the base and serrulate towards the apex, often with a dark purple spot above; *petioles* scarcely a line in length. *Involucre* small, its minute glands with a petal-like, white or purplish, somewhat crenate margin.

Gravelly places and cultivated grounds. July–October.

Obs. Very common everywhere, especially in Indian corn-fields, where it lies close to the ground, branching from the root in every direction, and forming a close mat.

2. *E. hypericifo'lia*, L. Ascending or erect; peduncles longer than the petioles, collected in loose, leafy cymes; pod obtusely angled, smooth; seeds blackish, obtusely angled.

HYPERICUM-LEAVED EUPHORBIA. Black Purslane. Large Spotted Spurge. Eye-bright.

Stem 9–18 inches high, rather slender and leaning as if top-heavy, with somewhat dichotomous spreading branches above, smoothish, often purple. *Leaves* half an inch to near an inch and a half long, obliquely ovate-oblong or sub-falcate, rather obtuse, sharply serrate, nearly entire towards the base on the rounded or convex side, more or less pilose with longish fine hairs, often stained with purple blotches along the midrib; *petioles* scarcely a line in length. *Clusters of flowers* axillary and dichotomal, pedicellate, forming small corymbs at the ends of the branches; appendages of the involucre minute, white, or purple edged with white, entire.

Sandy fields; pastures, road-sides, &c.: throughout the United States. *Fl.* July–September. *Fr.* September–October.

Obs. This species is very common in dry pasture fields—especially in thinnish sandy soils,—and has been suspected of being the cause of salivation, or slabbering, with which horses are often affected, in the latter part of summer. I cannot say how much foundation there may be for the suspicion; but I have often observed that horses are not apt to eat much of any acrid or unpalatable plant,—and are, moreover, very expert in selecting esculent herbs from among those which are not so. This plant is a worthless, obnoxious little weed,—and I believe is best kept down by improving the soil, and choking it out by more valuable substitutes.

Besides the species above noticed there are several others, both native and naturalized, to be found in various parts of the country, but they do not come within the scope of this work. *E. Ipecacuan'hæ*, L., is a perennial species with a large root which possesses powerfully emetic

qualities, hence it is called Wild Ipecac. *E. La'thyrus*, L., the Caper Spurge, a biennial species, is found in gardens, and is partially naturalized; it has a stout stem 2–3 feet high, with thickish, mostly opposite leaves; flowers in umbel-like clusters, the glands on the involucre with 2 short horns; this is sometimes called Mole Tree, from a popular notion that it kept moles out of gardens. An allied perennial species with running root-stocks, *E. Esula*, L., is naturalized in some parts of Massachusetts, where it is likely to become troublesome.

2. CNIDOSCO'LUS, Pohl. SPURGE-NETTLE.

[Greek, *Knide*, a nettle, and *Skolos*, a prickle.]

Flowers monœcious, in a terminal open forking cyme; the fertile ones usually in the lower forks. STAMINATE FL. *Calyx* corolla-like (white), salver-shaped, 5-lobed. *Stamens* 10, monadelphous below, the inner ones longer. PISTILLATE FL. *Calyx* as in staminate flowers, but 5-parted. *Ovary* 3-celled: *styles* 3, short, somewhat united, many-cleft. *Pod* 3-celled, bristly-hairy, 3-seeded, separating into three 2-valved carpels. Perennial herbs with stinging bristles.

1. *C. stimulo'sa*, Gray. Stem branching; leaves roundish-heart-shaped, 3–5-lobed, lobes sinuate toothed.

STINGING CNIDOSCOLUS. Spurge-nettle. Tread-softly.

Root long with long branches. *Stem* 6–18 inches high, and, as well as the leaves, covered with stinging bristly hairs. *Leaves* about 2 inches long and somewhat wider. *Sterile* flowers about half an inch in length, hairy.

Virginia and southward. Throughout the summer.

Obs. A troublesome weed in light sandy soils, its long branching roots penetrating 3–5 feet. The prickles produce great irritation for a short time.

3. RI'CINUS, Tournef. CASTOR-OIL PLANT.

[Latin, *Ricinus*, a tick, or bug; from the resemblance of the seeds.]

Flowers monœcious. *Calyx* 3–5-parted,—the lobes valvate in æstivation. *Corolla* none. STAMINATE FL. *Stamens* numerous; *filaments* variously united and much branched; *anthers* with the cells distinct and pendulous from the apex of the filament. *Ovary* globose, 3-celled; cells 1-ovuled; *style* short; *stigmas* 3, deeply 2-parted, oblong, colored, plumose. *Capsule* mostly echinate, 3-lobed; cells or carpels 1-seeded.

1. *R. commu'nis*, L. Stem herbaceous, hoary; leaves alternate, petiolate, peltate, palmately 5–7-lobed,—the lobes lanceolate, glandular-serate; capsule echinate.

COMMON RICINUS. Castor-oil Bean. Palma Christi.

Fr. Le Ricin ordinaire. Germ. Der Wunderbaum. Span: Ricino.

Root annual. *Stem* 4–6 feet high, stout, branched, terete, nodose, smooth, mostly purplish and covered with a glaucous powder. *Leaves* 6–12 inches across, palmately-lobed,



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—the undivided portion nearly orbicular, petioles 3-6 inches long, with a gland at apex, and sometimes 1, 2 or 3 near the base; stipule opposite to each leaf, embracing the stem, caducous. Flowers terminal, paniculate—the staminate below, the pistillate above, all on articulated pedicels. Calyx yellowish-green. Pistils purple and glaucous. Capsule covered with subulate points. Seeds subovoid, smooth, mottled.

Gardens and fields; cultivated. Native of India. Fl. July-September. Fr. Sept.-October.

Obs. Extensively cultivated in the south and west, and even as far north as New Jersey, for the valuable medicine, Castor-oil, which is afforded by its seeds. In our climate it is an annual, but in tropical countries it is perennial, and forms a small tree 30-40 feet in height. Often seen in gardens and door-yards as an ornamental plant. *

FIG. 183. Summit of the Spurge nettle (*Cnidoscolus stimulosus*), with the staminate flowers above and the fertile ones in the axils of the leaves below.

ORDÉR LXIV. URTICA'CEÆ. (NETTLE FAMILY.)

Herbs, shrubs or trees, with stipules and monoecious, dioecious or sometimes perfect flowers. having a regular calyx, free from the 1-celled (rarely 2-celled) ovary, which forms a 1-seeded fruit. Embryo in the albumen, when this is present; radicle pointing upwards. Stamens as many as the lobes of the calyx and opposite to them, or sometimes fewer.

A comprehensive and very important Order.—containing plants of various, and, in some instances, of remarkably dissimilar aspect and properties; such as the Nettle and the Mulberry—the bitter Hop and the luscious Fig—the nutritious Bread-fruit (*Artocarpus incisa*, L. f.) and the deadly Upas (*Antiaris toxicaria*, Leschen). The celebrated Cow-tree or Palo de Vaca (*Brosimum Galactodendron*, Don.), of South America, “which yields a copious supply of rich and wholesome milk,” belongs to this Order; as also does the yellow dye-wood, called Fustic (*Maclura tinctoria*, Don)—and the wide-spreading Banyan-tree (*Ficus religiosa*, L.), of India. A species of *Ficus* (*F. elastica*, Roxb.) also yields Caoutchouc, or Gum elastic.

We follow Doctor Gray in the arrangement of this Order; he places as sub-families of this, several which have been considered as families.

1. ELM SUB-FAMILY.

Trees with watery juice, alternate leaves and perfect or monoeciously polygamous flowers.

Styles or stigmas 2. Fruit a samara or drupe. Seed suspended.

Flowers mostly perfect. Anthers extrorse. Ovary 2-celled, 2-ovuled.

Fruit 1-celled, dry, winged.

Flowers polygamous. Anthers introrse. Ovary 1-celled.

Fruit a small drupe.

1. ULMUS.

2. CELTIS.

2. BREAD-FRUIT AND FIG SUB-FAMILY.

Trees or shrubs with milky or colored juice and alternate leaves; monoecious or dioecious flowers, in catkin-like heads or spikes, the parts of the fertile ones becoming fleshy in fruit, or both kinds in a fleshy receptacle. Styles 1–2. Ovary 1- (rarely 2-) celled, ripening as a dry akene. Inner bark often tough and fibrous.

Flowers minute, enclosed in a pear-shaped receptacle which is pulpy when ripe.

Flowers monoecious; both kinds in separate catkin-like spikes, the calyx &c., becoming berry-like in fruit. Stamens 4, styles 2.

Flowers dioecious; the fertile ones collected in a close round head, which is fleshy in fruit.

Sterile flowers in spikes. Unarmed.

Sterile flowers in racemes. Branches spiny.

3. FICUS.

4. MORUS.

5. BROUSSONETIA.

6. MACLURA.

3. NETTLE SUB-FAMILY.

Herbs with a watery juice, a tough fibrous bark, and opposite or alternate leaves. Flowers monoecious or dioecious in spikes, racemes, &c., not in catkins. Ovary 1-celled, forming an akene in fruit. Style 1. Stamens as many as the sepals.

Sepals 4, in both sterile and fertile flowers.

Plant beset with stinging bristles.

7. URTICA.

4. HEMP SUB-FAMILY.

Herbs with a watery juice, a tough fibrous bark and mostly opposite lobed or divided leaves. Flowers dioecious; the sterile in panicles or racemes, with 5 sepals and 5 stamens; the fertile crowded, with only one sepal which embraces the ovary. Stigmas 2, long.

Erect, annual. Fertile flowers in spiked clusters.

Leaves 5–7 divided.

Twining from a perennial root. Fertile flowers in short membranaceous catkins. Leaves 3–5-lobed.

8. CANNABIS.

9. HUMULUS.

1. UL'MUS, L. ELM.

[An ancient Latin name ; of obscure etymology.]

Calyx membranaceous, turbinate-campanulate, 4 – 9-cleft. *Stamens* as many as the lobes of the calyx. *Ovary* compressed, ovate, 2-celled, with a single ovule suspended from the summit of each cell ; *styles* 2, diverging, *stigmatose* on the inner side. *Samara* membranaceous, compressed, winged all round, by abortion 1-celled and 1-seeded. *Albumen* none ; *embryo* straight ; the *cotyledons* large. *Flowers* purplish-brown in lateral clusters preceding the leaves.

1. U. America'na, L. Leaves ovate, oblong, smooth above, very unequal at base, rather simply serrate,—the serratures uncinately acuminate ; flowers conspicuously pedicellate, in loose fascicles ; samara oval, densely villous-ciliate on the margin.

AMERICAN ULMUS. White Elm. Weeping Elm.

Stem 60 – 80 feet or more in height, and 2 – 3 or 4 feet in diameter ; branches long and spreading, or often rather drooping. *Leaves* 3 – 5 inches in length, acuminate ; *petioles* one fourth to half an inch long, smoothish. *Stipules* smooth. *Styles* pubescent, nearly white. *Samara* emarginate or bifid at apex between the 2 styles—the segments incurved so as to leave an apparent foramen through the wing ; margin densely fringed with soft white hairs.

Banks of streams, borders of swamps, &c.: throughout the United States. *Fl.* April. *Fr.* June.

Obs. This fine large tree is the species so much cultivated as a shade tree in New England. The noble avenues of Elms at New Haven, Conn., are the admiration of all visitors ; and nothing is required but a little attention at the proper season, to have every village in the land similarly adorned. Why will not the people of all our American towns and villages learn to do that much for the sake of taste and their own future comfort?

2. U. ful'va, Mx. Leaves oval or obovate-oblong, conspicuously acuminate, very scabrous above, rather unequal and somewhat cordate at base, doubly serrate ; buds clothed with a fulvous tomentum ; flowers in dense subsessile fascicles ; samara orbicular, naked on the margin.

TAWNY ULMUS. Slippery Elm. Red Elm.

Stem 30 – 50 feet high, and 12 – 18 inches in diameter ; branches virgate. *Leaves* 4 – 6 or 8 inches long—the upper surface remarkably rough, the under surface tomentose-pubescent, especially along the midrib and nerves ; *petioles* about one third of an inch long, pubescent. *Stipules* pilose. *Calyx* about 7-cleft ; lobes obtuse, clothed and ciliate with a reddish-tawny pubescence. *Stamens* often 7, much exserted. *Styles* glandular-pubescent, purple. *Samara* radiately veined, on a slender pedicel the length of the calyx, cleft at apex between the styles—the segments acuminate and so incurved and over-lapped as to give the margin the appearance of being entire at apex.

Rich low grounds, fence-rows, &c.: throughout the United States. *Fl.* April. *Fr.* June.

Obs. The inner bark of this species contains a large quantity of mucilage,—which has caused it to be added to the *materia medica* in our shops. The military on the Canada frontier, during the last war, fed their horses with it, when destitute of the usual forage, and found it a

tolerable substitute for hay. The tree being smaller, and the branches straggling, it does not answer for a shade tree so well as the preceding. Besides these species, *U. racemo'sa*, *Thomas*, the Corky White Elm, with racemed flowers and the bark often with corky ridges, is found in the North and West; and *U. ala'ta*, *Mx.*, the Winged Elm, or Wahoo, with small leaves and corky-winged branches, at the South and South-west. *U. CAMPES'TRIS*, *L.*, the English Elm, is frequently cultivated. It is a less graceful tree than our American Elm, having more the sturdy habit of an oak. Its wood is very valuable, as it is not liable to split or warp.

2. CEL'TIS, *Tournef.* NETTLE-TREE.

[An ancient name of the *Lotus*; applied to this genus.]

Flowers monœciously polygamous. *Calyx* 5 – 6-parted, persistent. *Stamens* as many as the sepals. *Ovary* ovoid, 1-celled, with a single suspended ovule; *stigmas* 2, elongated, recurved. *Drupe* globose, fleshy, smooth, 1-seeded. *Cotyledons* conduplicate, enclosing a scanty gelatinous central albumen. *Flowers* axillary, solitary or in pairs, dull, greenish-yellow.



1. *C. occidenta'lis*, *L.* Leaves obliquely ovate, acuminate, serrate; fruit on a peduncle once or twice the length of the petiole, reddish or yellow, turning dark purple at maturity.

FIG. 184. Flowers of the Nettle-tree (*Celtis occidentalis*). 185. Fruit and developed leaves. *a.* An enlarged flower opened to show the embryo.

WESTERN CELTIS. Nettle-tree. Sugar-berry. Hack-berry. Many-berry.

Stem 20 – 60 or 80 feet high. *Leaves* 2 – 4 or 5 inches long, more or less scabrous on the upper surface, and somewhat hairy beneath, finally coriaceous; *petioles* one third or half an inch in length. *Sepals* dull greenish-yellow, oblong-lanceolate. *Stigmas* densely pubescent, long, divaricate, with the points often incurved. *Drupe* edible, the pulpy coat thin, sweetish.

Rich light soils: throughout the United States. *Fl.* May. *Fr.* September.

Obs. A widely distributed but not very abundant tree, at least in the northern States, which seems to vary considerably; a low form found at the South is the *C. pumila*, Pursh; a variety with thick leaves is *C. crassifolia*, Lam. According to Michaux, the wood is but little esteemed, as it is not durable when exposed to the weather. It is said however to afford a fine charcoal.

3. FI'CUS, Tournef. FIG.

[An ancient name; of obscure derivation.]

Receptacle pyriform or subglobose, fleshy, concealing the florets in a central cavity,—the orifice at apex, close by small scales. *Florets* numerous, very minute, pedicellate, crowded on the internal surface of the receptacle, diœcious, or the upper ones staminate and the others pistillate. **STAMINATE FL.** *Calyx* 3-parted. *Stamens* 3, opposite the calyx-segments; *anthers* incumbent, 2-celled. **PISTILLATE FL.** *Calyx* 5-cleft,—the tube decurrent on the pedicel. *Ovary* seated somewhat laterally on a short stipe, 1-celled; *style* lateral, filiform; *stigma* bifid.

1. *F. CARI'CA*, L. *Leaves* cordate at base, 3 – 5-lobed, repand-dentate, lobes obtuse, scabrous above, pubescent beneath; receptacles pyriform, glabrous.

CARIAN FICUS. Fig-tree.

Fr. Le Figuier. *Germ.* Der Feigenbaum. *Span.* Higuera.

Stem 6 – 10 or 12 feet high—a stout branching shrub, with an acrid milky juice. *Leaves* 6 – 9 inches long, deeply 3-lobed with 2 shorter side-lobes; *petioles* 3 – 5 or 6 inches long, with large convolute stipules at base. *Receptacles* axillary, turbinate or pear-shaped, about an inch in diameter.

Cultivated. Native of Caria, in Asia. *Fl.* July. *Fr.*

Obs. This shrub requires the shelter of a green-house, in the middle and northern States,—where it produces freely. In the southern States it succeeds in the open air. The inflorescence, or position of the flowers, of the Fig—(concealed within the body of what is commonly regarded as the fruit.) is very remarkable;—being just the reverse of that of the Strawberry,—in which the minute pistils are scattered over the exterior of the enlarging succulent receptacle. In all the specimens I have examined the florets appear to be pistillate.

4. MO'RUS, Tournef. MULBERRY.

[Greek, *Morea*, the Mulberry.]

Flowers monœcious or diœcious in separate axillary catkin-like spikes. *Calyx* 4-parted,—the segments ovate. *Stamens* 4. *Ovary* sessile, ovoid,

2-celled; one of the cells smaller and disappearing; *stigmas* 2, terminal, filiform, villous on the inner side. *Akene* compressed, ovate, covered by the persistent succulent *calyx*,—the *whole spike* thus becoming a compound terete oblong *berry*.

1. *M. ru'bra*, *L.* Leaves cordate-ovate and acuminate, or sometimes 2 – 3-lobed, serrate, scabrous above, pubescent beneath; fruit dark purple.

RED MORUS. Red Mulberry.

Stem usually 15 – 25 feet high, and 9 – 18 inches in diameter (in some instances considerably taller and larger), with numerous spreading branches at summit. *Leaves* 4 – 6 or 8 inches long, more or less cordate (on young plants often 2 – 3 lobed, and very scabrous above), dentate-serrate, with an entire acumination, deep green and roughish on the upper surface, softly, and, while young, somewhat hoary-pubescent beneath, especially along the nerves; *petioles* 1 – 2 or 3 inches long, with linear membranaceous caducous *stipules* at base. *Flowers* greenish, small, numerous, in axillary pedunculate ament-like spikes—sometimes dioecious, and not unfrequently the spikes are *androgynous*. *Staminate spikes* 1 – near 2 inches long. *Pistillate spikes* more densely flowered, cylindric, about an inch long, becoming juicy, dark purple and pleasantly esculent when mature. *Peduncle* of the berry about an inch long.

Rich woodlands, fence-rows, &c.: throughout the United States. *Fl.* May. *Fr.* June – July.

Obs. The wood of this small tree is exceedingly durable, and highly valued for making posts, &c. The leaves have been successfully used for feeding silk-worms; but the product is said to be not so fine as that afforded by the White Mulberry. The fruit is more admired than that of any other species.

2. *M. al'ba*, *L.* Leaves obliquely cordate-ovate, and somewhat lobed, acute or sub-acuminate, serrate, smoothish and shining; fruit mostly yellowish-white.

WHITE MORUS.—White Mulberry.

Fr. Mûrier-blanc. *Ger.* Weisse Maulbeere. *Span.* Morera.

Stem 10 – 20 or 25 feet high, and 8 – 12 or 15 inches in diameter, much branched at summit. *Leaves* 2 – 4 inches long (sometimes, especially in young plants, 2 – 3 times that size), unequally crenate-serrate, often partially lobed, smoothish, shining and yellowish-green; *petioles* half an inch to an inch long, with lance-linear *stipules* at base. *Pistillate spikes* shorter and smaller than in the preceding. *Fruit* pale yellow or straw color when mature—rarely dark purple or nearly black.

About houses, fence-rows, &c.: introduced. Native of China, Persia, &c. *Fl.* May. *Fr.* June – July.

Obs. This species was introduced nearly a century since, with a view to the feeding of Silk-worms, and the production of silk. The silk-culture, however, was soon abandoned,—for, in that early stage of the colonies, the sparsely settled Agriculturists found it more important to multiply mammiferous animals, rather than Insects: but the tree became partially naturalized,—and is still frequently to be met with. About twenty years ago, a variety of the White Mulberry—of smaller stature, and much larger leaves, (well known by the name of *Morus multicaulis*), was introduced, as being still better adapted to the feeding of Silk-worms; and soon afterwards, a scene of speculation and in-

fatuation was exhibited, throughout the United States, which bade defiance to all the suggestions of reason and common sense. There was a sort of *Multicaulis monomania* (or *Moro-mania*!)—so universal, and engrossing, that it became absolutely ludicrous; and was scarcely exceeded in absurdity, by the nearly contemporaneous epidemic, which afflicted the nation in reference to its financial concerns. Almost every body was eagerly engaged in cultivating myriads of trees, to sell,—without stopping to enquire where they could be sold, or who would be likely to buy! At some future day—and under different circumstances,—it is quite probable that a portion of our population will find the Silk-culture an eligible business, and the *Morus multicaulis* a valuable little tree. The European Black Mulberry, *M. NI'GRA*, *L.*, is sometimes cultivated.

15. BROUSSONE'TIA, *Vent.* PAPER MULBERRY.

[Dedicated to *P. N. V. Broussonet*, a French Naturalist.]

Flowers dioecious. STAMINATE FL. in an ament-like spike, bracteate. *Calyx* 4-parted. PISTILLATE FL., capitate, densely crowded on a globose receptacle, and mixed with hairy scales. *Calyx* urceolate, 3–4-toothed. *Ovary* 1-celled, pedicellate; *style* filiform, excentric, *stigmata* on one side. *Akene* softly fleshy, elevated on the baccate pedicel, which is surrounded at base by the calyx.

1. *B. PAPYRIF'ERA*, *Vent.* Leaves scabrous above, pubescent beneath,—those on the young branches lobed, on the older ones mostly undivided, roundish-ovate or sub-cordate, acuminate, serrate.

PAPER-PRODUCING BROUSSONETIA.—
Paper Mulberry.

Stem 15–20 or 25 feet high, and 8–12 or 15 inches in diameter, with spreading branches,—the branches coated with a remarkably tough bark. *Leaves* 3–6 or 8 inches long; *petioles* 1–3 inches long. *Staminate spikes* about 2 inches long, resembling loose aments. *Pistillate flowers* in a dense capitate cluster.

About houses: introduced. Native of Japan and the South Sea Islands. *Fl.* May. *Fr.* Sept.

Obs. This tree was introduced some years since, as a shade-tree; but is inferior to many others in beauty,—and is now rarely planted for that purpose. The roots are so prolific in suckers, as to be quite a nuisance, about yards and gardens. The



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FIG. 186. A branch of the Paper Mulberry (*Broussonetia papyrifera*), reduced, with fertile aments and variously lobed leaves

leaves upon the young shoots and suckers present a remarkable diversity of shape. The pistillate tree is much less common than the staminate; and is even more objectionable than that, in streets, on account of the dirty appearance produced by the fallen fruit. The inner bark of this tree affords the South Sea Islanders a kind of tough paper, which they use as substitute for cloth.

6. MACLU'RA, Nutt. OSAGE-ORANGE.

[Named in honor of *William Maclure*,—a munificent patron of Natural Science.]

FLOWERS dioecious. STAMINATE FL. racemose. *Calyx* 4-parted. PISTILLATE FL., capitate, densely crowded, and coalesced, on a globose fleshy receptacle. *Sepals* 4, in opposite pairs, oblong, cucullate-concave, fleshy. *Ovary* sessile, 1-celled; *style* terminal, bifid,—one branch elongated and much exserted, *stigmatose* on the inner side—the other branch small or abortive. *Akenes* severally embraced by the fleshy *sepals*, which are all coalesced into a large compound globose lactescent *berry*, with a glabrous, but uneven, verrucose or irregularly tessellated surface. Small *trees*, with branches armed with very sharp slender *spines*.

1. *M. auranti'aca*, Nutt. Leaves lance-ovate, acuminate, entire, glabrous and shining above, roughish-puberulent beneath; berry subsessile, axillary, solitary.

ORANGE-LIKE MACLURA. Osage-orange. Bow-wood. Bodock.

Stem 15–25 or 30 feet high, with a much branched bushy top,—the branches virgate, but often inclined to droop or curve downwards, armed with small and very sharp spines. *Leaves* 4–6 inches long, subcoriaceous, mucronate by the extended midrib; *petioles* 1–2 inches long; *stipules* oblong, somewhat cucullate, caducous. *Pistillate flowers* coalesced in a solid globose head, which is 2 to near 3 inches in diameter, when fully grown; *styles* near an inch long, villous and finally purplish.

South Western States. FL. May–June. Fr. Sept.–Oct.

Obs. The roots of this tree are of a bright orange color, and so abundant and extensive as to be troublesome in gardens. The wood is very hard and durable. It was highly valued by the aborigines as a material for making bows, from which fact it was called by the early French settlers Bois d'arc, which has degenerated into Bodock in some parts of the country. Silk-worms feed greedily upon its leaves; and the plant, properly managed, makes a very neat and effective hedge.

7. URTI'CA, L. NETTLE.

[Latin, *uro*, to burn, *tactus*, touch; from the sensation produced by touching it.]

Flowers monœcious or dioecious, in panicle racemes or spikes, or close clusters. STAM. FL. *Sepals* 4. *Stamens* 4, inserted around the cup-shaped rudiments of a pistil. PISTILLATE FL. *Sepals* 4, in opposite pairs; the outer pair much smaller, somewhat keeled, spreading; the two inner flat or concave, in fruit membranaceous and enclosing the straight and erect ovate flattened *akene*. *Stigma* pencil-tufted. Plants with opposite leaves, greenish flowers, and armed with stinging hairs,

1. *U. dioica*, L. Leaves ovate-lanceolate, conspicuously acuminate, cordate at base, coarsely and acutely serrate; flowers often dioecious, in clustered paniculate spikes longer than the petioles.

DIOICIOUS URTICA. Nettle. Stinging-nettle.

Fr. Grande Ortie. *Germ.* Die Brennessel. *Span.* Ortiga.

Root perennial. *Stem* 2-3 feet high, obtusely 4-angled, branching, very hispid. *Leaves* 2 or 3-5 inches in length; *petioles* half an inch to 2 inches long, hirsute; *stipules* linear-lanceolate. *Flowers* small, in interrupted clusters, on slender axillary branching hispid spikes.

About houses, waste places, &c. : introduced. Native of Europe and Asia. *Fl.* June-Aug. *Fr.* Aug.-Sept.



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2. *U. u'rens*, L. Leaves elliptical or ovate, coarsely and deeply serrate with spreading teeth; flowers in simple capitate clusters, on peduncles, shorter than the slender petioles.

FIG. 187. The small Stinging-nettle (*Urtica urens*). 188. A staminate flower. 189. A pistillate one, both enlarged.

STINGING URTICA. Small Stinging-nettle.

Annual. Stem 8–12 inches high, erect. Leaves 1–2 inches long, obtuse or somewhat cordate at the base.

Waste places. New York State and Eastward.

Obs. These naturalized weeds, so well known for their stinging qualities, are apt, especially the first mentioned, to become troublesome where they are allowed to flourish. The quaint old herbalist, CULPEPPER, remarks “that they may be found by *feeling on the darkest night*.” In some parts of England nettles are used as a pot-herb, and the tough bark is said to afford a thread superior in durability to that from flax. There is a large-leaved native nettle which is now placed in another genus (*Lapor'tea canadensis*, *Gaudich*), the Wood-nettle, which is not inclined to intrude on cultivated lands. *

8. CAN'NABIS, *Tournef.* HEMP.

[An ancient Greek name,—of obscure etymology.]

STAMINATE FL., in axillary compound racemes, or panicles with 5 *sepals* and 5 drooping *stamens*. PISTILLATE FL., spicate-glomerate, with single bracts. *Calyx* of a single membranaceous *sepal*, folded around the subglobose *ovary*. *Nut* 1-celled, 2-valved, indehiscent.

1. C. SATI'VA, L. Leaves digitate, petiolate; leaflets 5–7, lanceolate, serrate.

CULTIVATED CANNABIS. Hemp.

Fr. Le Chanvre. Germ. Der Hanf. Span. Cañamo.

Root annual. *Stem* 5–8 or 10 feet high, obtusely angular and sulcate, scabrous-pubescent, often branched. *Leaves* mostly opposite (the upper ones often alternate); *leaflets* 3–5 inches long (the outside or lateral ones much smaller than the others, and often entire—especially on the *staminate* plant); *common petioles* 1–2 or 3 inches long; *stipules* lanceolate. *Staminate flowers* greenish, in loose pedunculate axillary clusters, rather crowded in a kind of dense panicle at summit. *Pistillate flowers* axillary, sessile, mostly in pairs. *Calyx* subglobose, acuminate, pubescent, green, slit on one side. *Stigmas* long, slender, densely pubescent, somewhat tawny. *Nut* ovoid, slightly compressed, smooth, greenish, reticulated with whitish veins, enclosed in the persistent calyx.

Cultivated. Native of Persia. FL. June. Fr. Aug.

Obs. This plant—so important in Commerce and the Arts—is cultivated on a large scale in Kentucky and some others of the fertile western States; but only to a limited extent in the middle and northern States.

9. HU'MULUS, L. Hop.

[Latin, *Humus*, moist earth, or mould; in allusion to its place of growth.]

STAMINATE FL. in loose oblong axillary-panicles with 5 *sepals*, and 5 erect *stamens*. PISTILLATE FL. in short axillary and solitary strobile-like aments; *bracts* foliaceous, imbricated in several rows, 2-flowered. *Calyx* a single membranaceous scale-like enlarging *sepal*, its folded mar-

gin embracing the ovary. *Nuts* roundish-ovoid, inclosed in the persistent truncate calyx. *Cotyledons* linear, spirally involute.



1. *H. Lu'pulus*, L. Leaves mostly 3-lobed, cordate at base, petiolate, scabrous.

Hop. Hop-vine.

Fr. Houblon. Germ. Der Hopfen. Span. Hoblón.

Root perennial, branching. *Stem* 10–15 or 20 feet long, several from the same root (or *rhizoma*), slender, voluble, somewhat angular and mostly twisted, retrorsely aculeate, with slender branches above. *Leaves* 3–5 inches long, generally opposite—the upper ones often alternate and not lobed,—all very scabrous on the upper surface; *petioles* 1–2 or 3 inches long; *stipules* ovate lanceolate, connate below, free at summit. *Staminate flowers* in oblong panicles. *Pistillate flowers* in pendulous ovoid-oblong bracteate *strobiles*, or *aments*, which are proverbially numerous and crowded (“as thick as hops”), 1–2 inches long at maturity; *bracts* orbicular or broadly-ovate, with a short abrupt acumination.

Cultivated, but indigenous in most parts of the United States. *Fl.* July. *Fr.* September.

Obs. The value of the Cones, or Aments, of the pistillate plant, is well known to every house-keeper; and it is cultivated for culinary

FIG. 190. The Hop (*Humulus Lupulus*), a branch of a staminate plant, reduced. 191. A separate staminate flower. 192. A young pistillate ament. 193. A ripe ament or strobile. 194. A much magnified grain of Lupulin.

purposes, in almost every garden. The medicinal virtues of the cones are also very considerable; they reside in the little *resinous atoms* (lupulin), which abound near the base of the scales. The hops for the breweries are cultivated on a large scale, in some districts of the middle and northern States—particularly in Western New York,—where, it is said, they are a profitable crop. The staminate plant is of so little account, that it is scarcely known except to the botanists.

ORDER LXV. PLATANA'CEÆ. (PLANE-TREE FAMILY.)

Trees, with a watery juice, and alternate, petiolate, palmately-nerved and lobed *leaves* with sheathing, deciduous *stipules* and *petioles* which are tumid and hollow at base, concealing the young buds. *Flowers* monœcious, minute and inconspicuous, densely crowded on globose receptacles,—both kinds destitute of floral envelopes; *heads* pendulous on long slender peduncles. STAMINATE FL. *Stamens* numerous, irregularly mixed with subclavate scales, densely crowded. PISTILLATE FL. *Ovaries* numerous, obconic or filiform-clavate, densely crowded, mixed with spatulate scales (*abortive ovaries*); *style* elongated, subulate, *stigmatose* on one side, near the apex. *Fruit* a 1-celled 1-seeded clavate coriaceous little *nut*,—the base surrounded with pappus-like hairs. *Seed* cylindric-oblong, pendulous; *embryo* in the axis of fleshy albumen.

An Order consisting of the single genus here given,—and the *generic character*, of course the same as that of the Order.

1. PLAT'ANUS, L. PLANE-TREE.

[Greek, *Platys*, broad; in allusion to its wide spreading branches and foliage.]

1. P. OCCIDENTA'LIS, L. Leaves roundish-pentagonal, acuminate, obscurely palmate-lobed, sinuate-dentate, pubescent beneath.

WESTERN PLATANUS. Button-wood. Sycamore. Plane-tree.

Stem 60–100 feet high, and 2–4 or 5 feet or more, in diameter, with large spreading branches, and a smoothish cinereous *bark*, which exfoliates in broad thinnish plates. *Leaves* 3–6 or 8 inches long, and wider than long,—the base at first truncate, finally subcordate, obscurely palmate or angulate-lobed, unequally sinuate-dentate with the teeth acuminate, loosely clothed with a hoary branching deciduous pubescence; *petioles* 1–3 inches in length, tumid and hollow at base, covering the young *bud* which is formed within and occupies the cavity; *stipules* somewhat salver-form, sheathing the young branches immediately above the petioles,—the *limb* spreading, foliaceous, coarsely and unequally toothed. *Staminate heads* or globes small, on peduncles 1–2 inches long, deciduous. *Pistillate heads* about an inch in diameter, pendulous on slender terete peduncles 3–5 inches long, persistent. *Nuts* about one-third of an inch long, slender, subterete, clavate, mucronate,—the base acute and invested with tawny pappus like hairs.

Banks of streams, road-sides, &c. : throughout the United States. Fl. April–May. Fr. Oct.

Obs. This stately tree—originating from a very small seed—often attains to a larger size than any other, east of the Rocky Mountains. It is sometimes planted for shade,—but becomes rather large for streets, or to stand near houses. The timber is not much esteemed,—though occasionally sawed into joists, and other lumber. For several years

past, the trees (or, at least, the branches), in the spring, appeared everywhere to be diseased and dying ; but they have still recovered again, more or less completely, in the course of the summer. The cause of this phenomenon,—(whether insects, as some suppose—or late unseasonable frosts, as I incline to think,) has not been satisfactorily determined.

ORDER LXVI. JUGLANDA'CEÆ. (WALNUT FAMILY.)

Trees with a resinous sweet or watery *juice*, alternate and odd-pinnate *leaves*, without *stipules*, and monœcious *flowers*.—the *staminate* ones with an irregular *calyx* in *aments*,—the *pistillate* ones with a regular 3–5-lobed *calyx*, adherent to the ovary, solitary or in small clusters. *Ovary* incompletely 2–4 celled, with but one *ovule*, becoming in *fruit* a kind of dry *drupe*, with a bony *endocarp* (nut-shell), containing a large 4 lobed *seed*, without *albumen*. *Cotyledons* fleshy and oily, sinuate-lobed.

An Order consisting chiefly of *Walnuts* and *Hickories*,—valuable for their wood and some of them for their *fruit*.

1. JU'GLANS, L. WALNUT.

[Latin, *Jovis Glans*, the nut of Jupiter ; by way of eminence.]

Aments of *staminate fl.* simple, cylindric, proceeding from buds without leaves. *Calyx* adnate to an entire 1-flowered bract, 5 or 6-parted,—the segments membranaceous, unequal. *Stamens* numerous, sub-sessile. *Pistillate fl.* terminal, solitary, or few and clustered. *Calyx-tube* ovoid adherent to the ovary,—the limb 4-toothed, with 4 small petals alternating with the calyx teeth. *Styles* 2, very short. *Stigmas* 2, elongated, recurved, papillose-fimbriate. *Fruit* drupaceous, containing a single nut,—the *epicarp* (or hull) somewhat fleshy, fibrous within, indehiscent,—the *nut* woody, rugose and irregularly sulcate. *Juice* resinous-aromatic ; *pith* separated into transverse laminæ or plates ; *young branches* brittle. *Trees* with nearly naked buds and odd-pinnate leaves of numerous serrate leaflets.

1. J. RE'GIA, L. Leaflets oval, rather acute, smooth, nearly entire ; fruit roundish-oval ; nut sub-compressed, smoothish.

ROYAL JUGLANS. English Walnut. Madeira Nut.

Fr. Noyer commun. Germ. Die Wallnuss. Span. Noguera.

Stem 20–30 or 40 feet high, branched. *Leaflets* 2–5 inches long, acute, or sometimes rounded and emarginate at apex, subserrate or entire, villous in the angles of the nerves beneath, in 3–5 pairs with a terminal odd one,—the lower pairs smaller. *Aments* ovoid-oblong, 2–3 inches in length. *Pistillate flowers* in small terminal clusters of 2–3, on a rather short common peduncle. *Drupe* oval or subglobose, mucronate, about 2 inches long and 1–2 inches in diameter, with a smoothish subcoriaceous *epicarp* ; *nut* smoothish or somewhat corrugated.

About houses : cultivated. Native of Persia. Fl. May. Fr. Oct.

Obs. This oriental species is called English Walnut, in consequence, as I suppose, of its having come to us by way of the mother country. Such misnomers are not unfrequent, among cultivated plants. This one

is occasionally cultivated for the young fruit,—which makes a favorite pickle. The tree is rather impatient of the climate, in the rural districts of Pennsylvania; but does very well in the shelter afforded by our cities and large towns. The nuts are rarely perfected, here; but those imported, are highly esteemed.

2. *J. cine'rea*, L. Leaflets oblong-lanceolate, rounded at base, softly pubescent beneath, with the petioles and branchlets downy with clammy hairs; drupe ovoid-oblong, coriaceous, viscid-pubescent; nut elliptic-oblong, acuminate, conspicuously sculptured.

CINEREOUS JUGLANS. White Walnut. Butter-nut.

Stem 20–50 feet high, with numerous branches and a smoothish cinereous bark. *Leaflets* 2–4 or 5 inches long, serrate, sessile, softly pubescent and paler beneath, in 7–8 pairs with a terminal odd one. *Aments* 3–5 inches long. *Pistillate flowers* 3–5 or 7, in a terminal spike, rather distant, sessile on a long common peduncle. *Drupe* 2–3 inches long, and 1 to near 2 inches in diameter, elliptic-ovoid with a short tapering protuberance at apex, often slightly compressed and obscurely angular, softly hairy and clammy,—the *epicarp* somewhat coriaceous.

Rich bottom lands, along streams, &c.; throughout the United States. *Fl.* May. *Fr.* Sept. – Oct.

Obs. The bark of this tree affords an extract (Butter-nut Physic), which is a convenient and popular cathartic. The young drupes, collected about the last of June, make excellent pickles. The kernel of the mature fruit is oily, and soon becomes rancid. The bark as well as the husks of the fruit are sometimes used as a dye, and the wood, though lighter colored and less valuable than that of the following species, is durable when exposed to heat and moisture, and is used for panels of coaches and similar purposes.

3. *J. ni'gra*, L. Leaflets ovate-lanceolate, subcordate at base, the under surface and petioles slightly pubescent; drupe globose, roughish-dotted, spongy; nut subglobose, rugose-sulcate.

BLACK JUGLANS. Black Walnut.

Stem 40–60 or 80 feet high, with spreading crooked branches,—often forming a broad roundish and rather open top. *Leaflets* 2–4 inches long, serrate, subsessile, in 7–10 pairs, with a terminal odd one which is often starved, or abortive. *Aments* about 2 inches long. *Pistillate flowers* in small terminal clusters of 2–4, on a short common peduncle. *Drupe* an inch and a half to 2½ inches in diameter, mostly globose, sometimes oval or oblong-ovoid, greenish-yellow when mature,—the *epicarp* (or “hull”) more or less succulent and spongy.

Rich woodlands, fence-rows, &c.: throughout the United States. *Fl.* May. *Fr.* October.

Obs. The dense dark-brown wood of this species is valuable,—and is much used by Cabinet-makers, as a substitute for Mahogany. The spongy epicarp is often employed as a domestic dye-stuff,—and the nucleus, or kernel, although somewhat oily, is generally esteemed. The young fruit and leaves, when rubbed or bruised, emit a strong and not unpleasant resinous odor. This tree, when prevalent, is a pretty sure indication of a fertile soil.

2. CA'RYA, Nutt. HICKORY.

[Greek, *Karya*,—the ancient name of the Walnut.]

STAMINATE FL. in slender lateral aments, which are mostly in threes, from the same buds with the leaves. *Calyx* scale-like, unequally 3-parted. *Stamens* 3–8; *anthers* sub-sessile. PISTILLATE FL. in terminal clusters of 2–3. *Calyx* 4-cleft; *petals* none; *stigmas* large, 4-lobed. *Fruit* with a thick leathery *husk*, opening more or less completely by 4 valves; *nut* long, smooth, usually somewhat 4-angled. *Juice* watery or often sweetish; *pith* continuous; *young branches* tough and pliable; *leaflets* acuminate; *pubescence* stellate. All flowering in May and dropping their nuts in October.

* *Seed* edible; *valves* of the *hull* completely separating.

† *Fruit* oblong; the *husk* thin: *bark* of the *trunk* not shaggy.

1. *C. olivæfor'mis*, Nutt. *Leaflets* 11–15, lanceolate and somewhat falcate, serrate, subsessile,—the terminal one petiolulate; *fruit* obovoid-oblong; *epicarp* rather thin; *nut* olive-shaped, obscurely 4-angled, with an even surface.

OLIVE-SHAPED CARYA. Pecan Hickory. Pecan nut.

Stem 40–50 feet high. *Leaflets* in 5–7 or 8 pairs, with a terminal odd one, 3–6 inches in length, smooth, with a short roughish pubescence on the midrib and nerves beneath. *Fruit* 1 to near 2 inches long; *nut* with a thin frangible *shell*,—the *kernel* large.

Wet low grounds: Western and South-western States.

Obs. This tree is little known, in the North, except by its very fine nuts,—which are even superior to those of the admired Shell-bark.

†† *Fruit* globular, with a very thick *husk*: *bark* of the *trunk* shaggy, falling off in strips.

2. *C. al'ba*, Nutt. *Leaflets* 5, obovate-lanceolate, acuminate, sharply serrate; aments smoothish; *fruit* depressed-globose; *epicarp* thick; *nut* 4-angled, compressed, with the shell thin.

WHITE CARYA. Shell-bark, or Shag-bark Hickory.

Stem 60–80 feet high, with the outer *bark* exfoliating in long scales or plates, which generally adhere in the middle, while one or both ends are detached and elevated, making the surface very rough and shaggy. *Leaflets* mostly in 2 pairs with a terminal odd one, 3 or 4–6, 8 or 10 inches long, the terminal one usually largest, and the lower pair much smaller. *Aments* at the base of the young growth, 2 or 3–4 or 5 inches long, triple or 3-parted on a common peduncle, smoothish, pendulous, with a linear-lanceolate bract at the base of each branch or lateral ament. *Stamens* mostly 4,—the *anthers* somewhat hairy. *Pistillate flowers* terminal, mostly 2–3 together, sessile on a common peduncle. *Fruit* somewhat umbilicate at the ends, and depressed or sulcate along the sutures of the valves; *epicarp* (or *hull*) thick and subcarnosely coriaceous, opening at maturity into 4 distinct valves or pieces; *nut* about an inch long, suborbicular or oval, compressed and somewhat 4-angled, white,—the *shell* thin and frangible.

Low lands; along streams, &c. New England to Carolina.

Obs. The nuts of this tree are well known, and highly esteemed. I think there are some varieties,—with the bark less shaggy, the fruit with a thinner epicarp, a thicker shell, and the kernel of inferior quality. The

Thick Shell-bark Hickory, *C. sulcata*, Nutt., is a nearly allied species found in Pennsylvania and westward. It is distinguished by having 7–9 leaflets, an oval 4-ribbed fruit with intervening furrows and a yellowish, thick-shelled, strongly-pointed nut.

** Seed small, but edible; valves of the hull only partially separating.

3. *C. tomentosa*, Nutt. Leaflets 7–9, oblong or obovate-lanceolate,

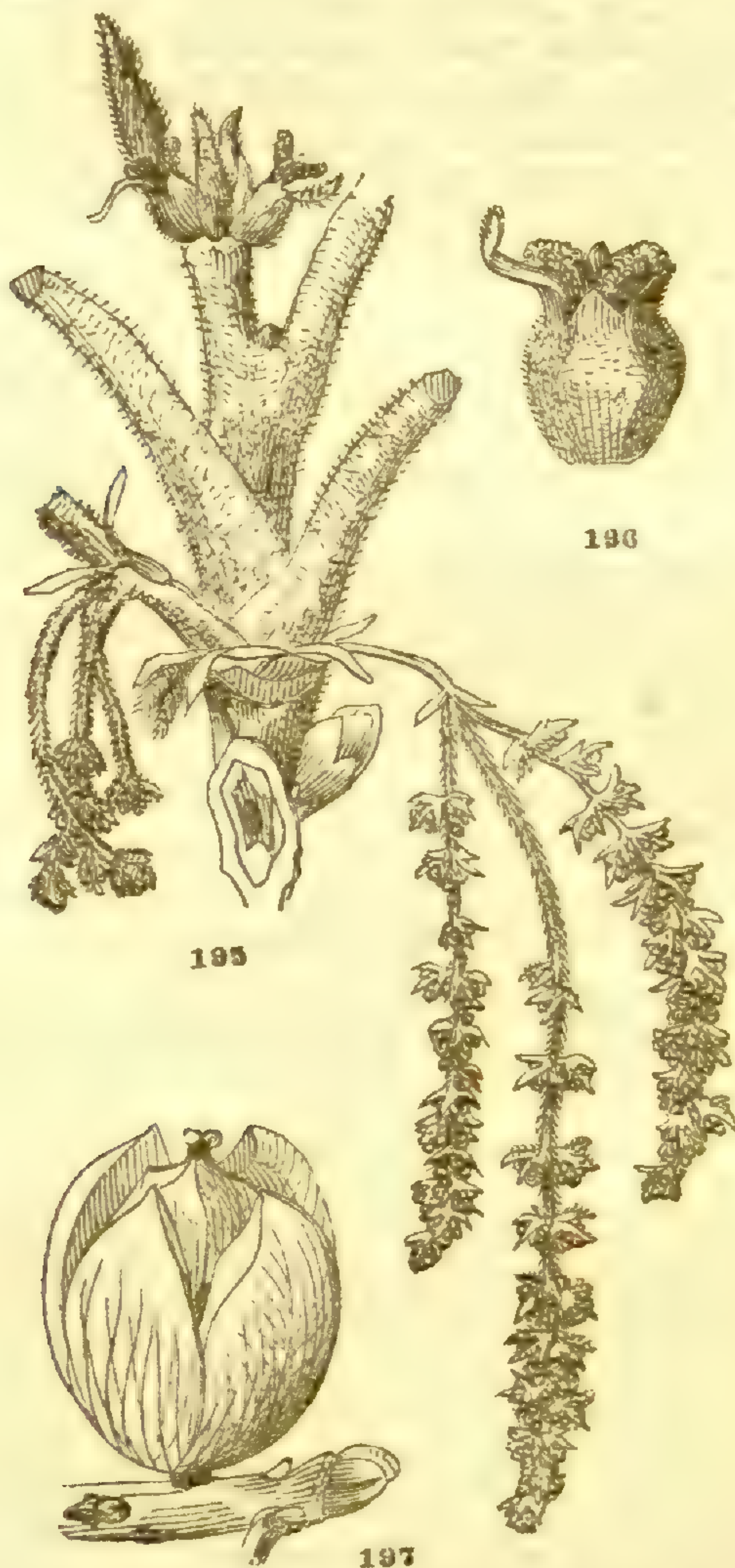


FIG. 195. The flowers of the Mocker Nut Hickory (*Carya tomentosa*) the pistillate flowers above, the staminate ones in loose hanging aments. 196. A separate pistillate flower. 197. The ripe nut showing the husk (epicarp) splitting into 4 valves.

slightly serrate, rough-downy below; aments tomentose; fruit globular or ovoid; nut rather large, somewhat 6-angled, pale brown and thick-shelled.

TOMENTOSE CARYA. White-heart Hickory. Mocker-nut.

Stem 60 - 80 feet or more in height,—the *bark* with the fibres interlocked and not exfoliating. *Leaflets* generally in 3 pairs with a terminal odd one, 3 or 4 - 8 inches long (the two lower pairs considerably smaller than the others), smoothish above, clothed with a roughish stellate pubescence beneath, and sprinkled with minute dark-purple particles among the pubescence. *Aments* 4 - 6 or 7 inches long, filiform, pubescent. *Pistillate flowers* mostly in pairs, sessile on a short thick bracteate common peduncle. *Fruit* ovoid or oblong-oval, large (often 2 inches or more in length, and $1\frac{1}{2}$ in diameter); *epicarp* thick and coriaceous, opening by 4 valves more than half way to the base; *nut* somewhat 6-angled near the apex,—the *shell* very thick and bony,—the *kernel* rather small, and, though esculent, much inferior to the preceding.

Upland forests: New England to Virginia. *Fl.* May. *Fr.* October.

Obs. This species, also, appears to present several varieties,—some of them producing remarkably large fruit. All the Hickories are noted for affording good fuel; but the wood of this one (which is white to the heart—while the others are more or less red, within,) is considered the best of all, for that purpose. It is replete, in early summer, with a sweet syrup-like sap,—and when cut, at that season, is much preyed upon by worms. The proper time for cutting it is the month of August.

4. C. gla'bra, Torr. Leaflets 5 - 7, ovate-lanceolate, serrate, nearly smooth; fruit pear-shaped or roundish, thin; nut smooth and even, thinish-shelled but hard.

SMOOTH CARYA. Pig-nut Hickory. Broom Hickory.

Stem 40 - 60 or 70 feet high, with a close bark, and numerous tough branches. *Leaflets* usually in 3 pairs (not unfrequently in 2 - 4 pairs,) with a terminal odd one, 2 or 3 - 5 or 6 inches long, generally smooth on both sides—sometimes a little pubescent beneath—sprinkled with minute purple particles. *Aments* ternately branched or in pairs 2 - 4 or 5 inches long, filiform, smoothish. *Pistillate flowers* terminal, solitary, or 2 or 3 sessile and rather distant on a common peduncle. *Fruit* rather small, subglobose, oblong, or obovoid,—the obovoid variety often a little compressed and retuse, or obcordate; *epicarp* thin and coriaceous, opening partially (at summit) by 4 valves; *nut* smooth and even,—the *shell* often hard, but sometimes thin and frangible; *kernel* often astringent and bitter,—sometimes esculent, but of inferior quality.

Moist woodlands and low grounds: New England to Carolina. *Fl.* May. *Fr.* October.

Obs. The young saplings of this species were much used, formerly, for making splint brooms; and the tough sprouts, or seedling plants, are often employed as ligatures, in rural economy, under the name of hickory withes. The wood of the older trees is used by wheelrights for making axles of carts and wagons: and, like that of all the species, is much esteemed for fuel. The small fruited Hickory, *C. microcar'pa, Nutt.*, has similar foliage but is distinguished by its very small fruit, which is only $\frac{1}{4}$ of an inch in diameter. The Bitter-nut, *C. ama'ra, Nutt.*,

is another species resembling the Pig-nut, having small thin-shelled nuts, the kernels of which are intensely bitter.

ORDER LXVII. CUPULI'FERÆ. (OAK FAMILY.)

Trees or shrubs with alternate simple penni-nerved leaves, deciduous stipules and monœcious flowers; the staminate ones in cylindrical (capitate-clustered in the Beech), aments; the pistillate solitary or clustered, furnished with an involucre which forms a kind of cup (cupule) to the 1-celled 1-seeded indehiscent nut. Ovary 2-7-celled with 1-2 ovules in each cell; all the cells and ovules but one disappearing in the fruit. Calyx-tube adherent to the ovary, the minute calyx-teeth crowning its summit. Seed without albumen, filled by the embryo,—the cotyledons thick and fleshy.

* Fertile flowers scattered or few in a cluster.

Involucre 1 flowered, of many little scales, forming a cup around the base of the hard, rounded nut or acorn.

Involucre 2-3 flowered, forming a prickly bur, enclosing 1-3 nuts and splitting into 4 thick valves.

Involucre 2-flowered, prickly, 4-valved, containing 2 sharply triangular nuts. Sterile flowers in small head-like clusters.

Involucre 1-2-flowered becoming a leafy cup, much enlarged and cut or torn at the apex, longer than the bony nut.

** Fertile flowers clustered in a kind of ament.

Involucre an open 3-lobed leaf, 2-flowered. Fruit a small ovoid nut.

Involucre a bladderly bag, 1-flowered, the whole catkin in fruit appearing like a hop. Fruit small and seed-like.

1. QUERCUS.

2. CASTANEA.

3. FAGUS.

4. CORYLUS.

5. CARPINUS.

6. OSTRYA.

1. QUER'CUS, L. OAK

[The ancient classical name.]

STAMINATE FL. Aments slender, pendulous, without bracts. Calyx 6-8- (mostly 5-) parted. Stamens 5-12; anthers 2-celled. PISTILLATE FL. scattered or clustered. Involucre 1-flowered,—formed of minute bracts, and scales, imbricated in many series, and coalesced into a cup, and becoming woody or bark-like. Calyx adherent to the ovary,—the limb 6-toothed. Ovary 3-celled; ovules in pairs in the cells, collateral, suspended; stigmas as many as the cells of the ovary. Nut (or Acorn) by abortion 1-seeded, ovoid or oblong, mucronate, coriaceously woody, embraced and more or less included by the indurated cup-like involucre. Seed pendulous; testa membranaceous, thin; cotyledons plano-convex, thick and fleshy. Mostly trees with greenish or yellowish flowers, the pistillate ones quite inconspicuous; all appearing in May, and the fruit generally mature in October. In a portion of our species the acorns are biennial,—i. e., 2 years in coming to maturity. This peculiarity serves to divide them into 2 sections which are subdivided into groups distinguished by the outline of the leaves.

‡ 1. Fruit annual (ripening in the fall after flowering); clusters mostly peduncled: leaves not bristly-pointed or toothed.

* WHITE OAK GROUP. Leaves obtusely sinuate or pinnatifid-lobed, all pale, whitish or grayish-downy underneath.



1. *Q. macrocarpa*, *Mx.* Leaves deeply and somewhat lyrate-sinuate-lobed, the lobes obtuse, sparingly and obtusely toothed; acorn very large; cup hemispherical, fringed above with hard and thick-pointed scales, the uppermost of which are awned; nut ovoid, more than half immersed in the cup.

LARGE-FRUITED QUERCUS. Bur-oak. Over-cup Oak. Mossy-cup White Oak.

Trunk 40–60 feet high. *Leaves* obovate in outline, 6–12 inches or more in length; the smaller ones entire. *Acorns* 1–1½ inch long, sometimes entirely enclosed in the conspicuously fringed cup.

West New England, west and southwest.

Obs. A handsome middle-sized tree with luxuriant foliage and remarkably large acorns. The wood is valuable for those uses which require stiff and durable wood. As a fuel it takes rank with the White Oak. A variety with

narrower and more deeply lobed leaves and oblong fruit is the *Quercus olivæformis* of Michaux.



2. *Q. obtusiloba*, *Mx.* Leaves tawny pubescent beneath, obovate-oblong, cuneate at base, irregularly sinuate-lobed, the upper lobes larger and often 1–3-notched; acorn roundish ovoid, rather small.

OBTUSE-LOBED QUERCUS. Barrens White Oak. Post Oak. Rough Oak.

Stem 20–40 or 50 feet high; branches irregular, spreading, densely pubescent when young. *Leaves* 4–6 inches long, thick and coriaceous, mostly with 3 unequal lobes on each side and unequal angular sinuses—the upper surface smoothish and shining (often roughish with short fasciculate hairs, when young), the under surface pale ferruginous, or tawny, and clothed with a stellate pubescence; *petioles* about half an inch long. *Acorn* rather small, oval or roundish-ovoid, with the apex often depressed or umbilicate—the lower half embraced by the scaly hemispherical cup, which is sessile, or the fruit often in small clusters on a common peduncle.

Dry sterile hills. Massachusetts, west and south.

Obs. This tree seems to be confined to barren hills, and exposed ridges.

FIG. 198. The Bur or Over-cup Oak (*Quercus macrocarpa*). The figures of all the oaks represented here are less than half the natural size.

FIG. 199. The Post or Rough Oak (*Quercus obtusiloba*.)

The wood is very durable, and much valued for posts, &c. It also makes excellent fuel.

3. *Q. al'ba*, L. Leaves oblong, pinnatifid-sinuate,—lobes nearly equal, oblong, obtuse, mostly entire, the sinuses narrow; cupule somewhat bowl-shaped, tuberculate; acorn ovoid-oblong.

WHITE QUERCUS. Common White Oak.



Stem 60 - 80 and 100 feet high, and 2 - 4 or 5 feet in diameter, with a whitish or light

FIG. 200. A flowering branch of the White Oak (*Quercus alba*), showing the aments of staminate flowers. 201. A separate staminate flower. 202. A leaf and acorns.

grey bark. *Leaves* 4-6 inches long, subcoriaceous, smooth, nearly equally pinnatifid, usually with 3-4 lobes on each side (sometimes cuneate and 3-lobed); *petioles* half an inch to an inch long. *Acorn* rather large, seated in a shallowish bowl shaped cup, which is pubescent and rough externally with roundish tubercles—the fruit generally in pairs, sessile on a common peduncle about half an inch long.

Woodlands, throughout the United States: often abundant in moist low clayey grounds.

Obs. This is one of our finest and most valuable forest trees,—and frequently attains to an enormous size. Its prevalence, however, is not so indicative of a good soil, as that of the *Q. tinctoria*, or Black Oak. The timber is firm and durable, though somewhat liable, when in the form of boards and scantling, to warp or spring. It is extensively used in the mechanic arts,—especially by the wheel-wright, the mill-wright, and the ship-wright. The keels of some of our finest national vessels have been obtained from this Oak. It also affords the best quality of coopers' stuff, for making liquor-casks. The bark is astringent and tonic, and is frequently employed in medical practice. The acorns are sweet, affording a nutritious and favorite food of swine. On young trees the leaves are remarkably persistent, after they are killed by the frost, in autumn.

**** CHESTNUT OAK GROUP.** *Leaves coarsely and obtusely sinuate-toothed, but not lobed, whitish, and more or less downy beneath: cup hoary; acorns sweetish.*



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4. *Q. Pri'us*, L. *Leaves* obovate and elliptic-oblong, acute or acuminate, finely pubescent beneath, coarsely and nearly equally sinuate-dentate,—the teeth obtuse; fruit on short common peduncles; cupule nearly hemispherical; acorn oval.

Swamp Chestnut Oak. Chestnut White Oak.

Stem 60-80 or 90 feet high, and 2-3 or 4 feet in diameter. *Leaves* 5-8 inches long, pinni-nerved with a coarse obtuse tooth for each nerve, and a small callus at the apex of each; *petioles* 1-near 2 inches long. *Fruit* in pairs (1 often abortive), on a common peduncle about half an inch long. *Acorn* large, oval or ovoid-oblong, seated in a scaly bowl-shaped cup which embraces nearly one third of the nut.

Moist low woodlands: Pennsylvania to Florida.

Obs. This species, which is often a fine tree, presents some marked

FIG. 203. The Swamp Chesnut Oak (*Quercus Prinus*.)

varieties which were formerly considered as species, but which are now only regarded as varieties due to soil and situation. The variety *monticola*, *Mx.*, (*Quercus montana*, *Willd.*) known as the Rock Chestnut Oak, is a form growing in hilly woodlands, and has more valuable timber. Var. *discolor*, *Mx.* (*Q. bicolor*, *Willd.*) is the Swamp White Oak; it has the leaves more deeply toothed and densely whitish-downy beneath, and the upper scales of the cup are sometimes awned so as to form a fringed margin. Quality of the wood variable.

The acorns of all the varieties are sweet and nutritious, and sought after by swine.

5. *Q. Castanea*, *Willd.* Leaves oblong-lanceolate, acuminate, pubescent and cinereous beneath, nearly equally dentate or sinuate-serrate,—the teeth rather acute, and callous at apex; fruit sessile; cupule nearly hemispherical; acorn elliptic-ovoid.

CHESTNUT QUERCUS. Chestnut Oak. Yellow Oak.

Stem 40–60 or 70 feet high, and 1–2 feet in diameter. *Leaves* 3–6 inches long, the points of the teeth (and along the whole margin) callous, the upper surface smooth and yellowish-green, the under surface finely pubescent and whitish or cinereous; *petioles* half an inch to an inch long. *Acorn* rather small, seated in a pubescent bowl-shaped cup, which embraces one third of the nut, and is either sessile on the branch or on a short common peduncle.

Mountains, slaty hills and banks of streams: Middle and Western States.



Obs. This is often a fine tree,—though not so common, in Eastern Pennsylvania, as the others of this subdivision. It presents some varieties—at least in the leaves; but they generally have a striking resemblance to those of the Chestnut tree. The acorns are said to be more sweet and nutritious than those of any other species. There is a dwarf species, the Chinquapin Oak, (*Q. prinoides*, *Willd.*) belonging to this subdivision—common on sandy soil; but it is too small and unimportant to require a more particular notice here.

§ 2. *Fruit biennial, not maturing till the second year after flowering, sessile or nearly so; kernel bitter.*

* **LIVE OAK GROUP.** *Leaves evergreen, nearly entire, hoary beneath.*

FIG. 204. The Chestnut or Yellow Oak (*Quercus Castanea*).



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6. *Q. vi'rens*, Ait. Leaves coriaceous, elliptic-oblong, somewhat toothed or angled on young trees, entire on old ones, with a revolute margin, rather acute at apex, but not mucronate, stellately pubescent beneath; cupule turbinate, pedunculate; acorn oblong.

GREEN QUERCUS. Live Oak.

Stem 20-40 or 50 feet high, and 1 or 2-5 or 6 feet in diameter, with numerous large wide-spreading crooked branches—the wood remarkably dense and heavy, with twisted gnarled fibres. *Leaves* an inch and a half to 3 inches long, perennial, but a portion of them falling from the old trees every spring, dark green above, whitish beneath, on short petioles. *Acorn* ovoid-oblong or oval, of a dark brown color, seated in a bowl-shaped pedunculate cup—the *peduncle* about an inch long, axillary.

Sea coast: Virginia to Florida.

Obs. This noted tree—so valuable in ship-building—is pretty much confined to the sandy sea-coast of the Southern States. Its most northern locality appears to be at Old Point Comfort, near Norfolk, Virginia,—where it is reduced to quite a small tree. Four or five other species, belonging to this group, are found in the United States—chiefly in the South; but they are mostly small, and of little value.

** WILLOW OAK GROUP. *Leaves deciduous, entire, narrow.*

7. *Q. Phel'los*, L. Leaves linear-lanceolate, tapering at each end, glabrous; cupule saucer-shaped; acorn roundish.

Willow-leaved Oak. Willow Oak.

Stem 40-60 or 70 feet high, and 1-2 feet or more in diameter, with a smoothish bark. *Leaves* 2-4 inches long, subsessile, entire or the young ones sometimes dentate. *Acorn* small, subglobose, seated in a shallow saucer-like subsessile cup.

Moist low grounds. New Jersey, Kentucky and South.

Obs. There are apparently some varieties of this,—or, if they are specifically distinct, nearly allied species. The tree sometimes acquires considerable size,—but the timber is not particularly valuable; and as it is rather local in its habitat, is not much known beyond those limits.

8. *Q. imbrica'ria*, Mx. Leaves deciduous, lance-oblong or elliptic-lanceolate, acute at each end, mucronate, smooth and shining above, pubescent beneath; cupule saucer-shaped; acorn somewhat hemispherical.

FIG. 205. The Live Oak (*Quercus vi'rens*).

SHINGLE QUERCUS. Laurel or Shingle Oak.

Stem 40-60 feet high, and 1-2 feet in diameter, with a smoothish bark; branches numerous and irregular. *Leaves* 3-5 inches long, entire, somewhat crowded on short petioles. *Acorn* rather small, roundish above, with a broad flattish base so as to be nearly hemispherical, seated in a shallow subsessile cup.

Banks of streams. New Jersey, southward, and in the Western States.



Obs. This species—being chiefly confined to the country west of the Alleghany Mountains—is but little known in the east; and although deriving its specific name from the roofing material which it affords, its timber is said to be of an inferior quality—even for that purpose.

*** **BLACK AND RED OAK GROUP.** *Leaves deciduous, bristle-pointed, repand or acutely sinuate-lobed.*

† *Mature leaves downy underneath.*

9. Q. ni'gra, L. Leaves somewhat coriaceous, cuneate, dilated at apex, retuse or obscurely 3-lobed, smooth above, covered with a russet pulverulent pubescence beneath, when young the nerves setaceously mucronate; cupule subturbinate; acorn ovoid.

BLACK QUERCUS. Black Jack. Barren Oak.

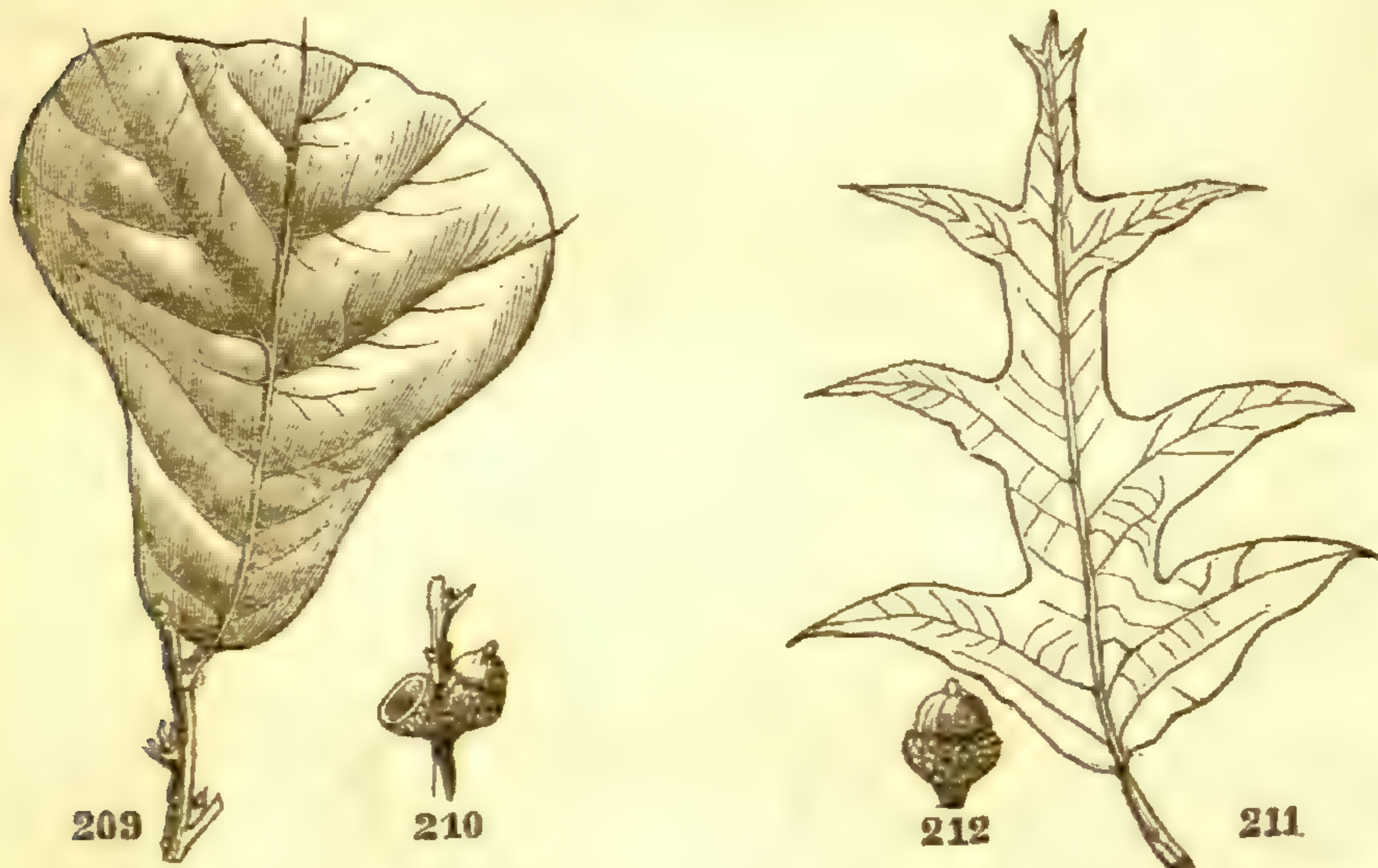
Stem 15-30 or 40 feet high, and 6-12 or 15 inches in diameter, with a thickish furrowed dark-colored bark; branches numerous. *Leaves* 5-8 inches long, much dilated at apex (4-6 inches wide), narrowed towards the base, on short petioles. *Acorn* ovoid, seated in a rather deep or bowl-shaped subsessile cup.

Sterile soils: New Jersey to Illinois and southward.

Obs. This small tree—abundant in Maryland, and well known by the name of “Black Jack,”—is chiefly valuable for fuel. The nearly related

FIG. 206. The Willow Oak (*Quercus Phellos*.)
FIG. 207. The Laurel or Shingle Oak (*Quercus imbricaria*). 208. An acorn.

Water Oak, *Q. aquatica*, *Catesby*, which has narrower leaves, tapering to the base, is found in wet grounds in the Southern States.



10. *Q. falcata*, *Mr.* Leaves elongated and rather narrow, sinuate-lobed, or sometimes almost palmately 3-lobed, obtuse at base, densely tomentose beneath; lateral lobes falcate, the terminal one longer and trifid; cupule shallow, subturbinate; acorn roundish-ovoid.

FALCATE QUERCUS. Spanish Oak.

Stem 40–50 or 80 feet high, and 1 or 2–4 feet in diameter. *Leaves* 3–6 and 9 inches long, with 2–4 or 5 (usually 3) distant more or less falcate entire lobes on each side—those on small trees or young branches often dilated and 3-lobed at apex, with the side-lobes diverging; *petioles* about an inch long. *Acorn* small, seated in a shallow saucer-like cup, which is tapering at base and supported on a short peduncle.

Sandy or sterile clay soils: New Jersey to Georgia.

Obs. This tree (which is the genuine “Spanish Oak,”)—so far as I have observed—seems to be pretty much confined to that district, along the Atlantic coast, which is marked as alluvial on Geological maps. It is said to grow very large, in the South; but is rather below an average size, near its northern limits. The timber is reddish, coarse-grained and not very durable,—but is much used for the inferior kinds of coopers’ stuff. The bark, however, is reputed as preferable to that of every other species of Oak, for tanning. The dwarf species, known as Scrub Oak, or Bear Oak, is *Q. illicifolia*, *Wang.*; it has obovate leaves with a wedge-shaped base, and angularly about 5-lobed. It is a worthless little species, 3–8 feet high; abounding on poor soils from New England to Virginia and westward to Ohio.

FIG. 209. The Black Jack or Barren Oak (*Quercus nigra*). 210. An acorn.
FIG. 211. The Spanish Oak (*Quercus falcata*). 212. An acorn.

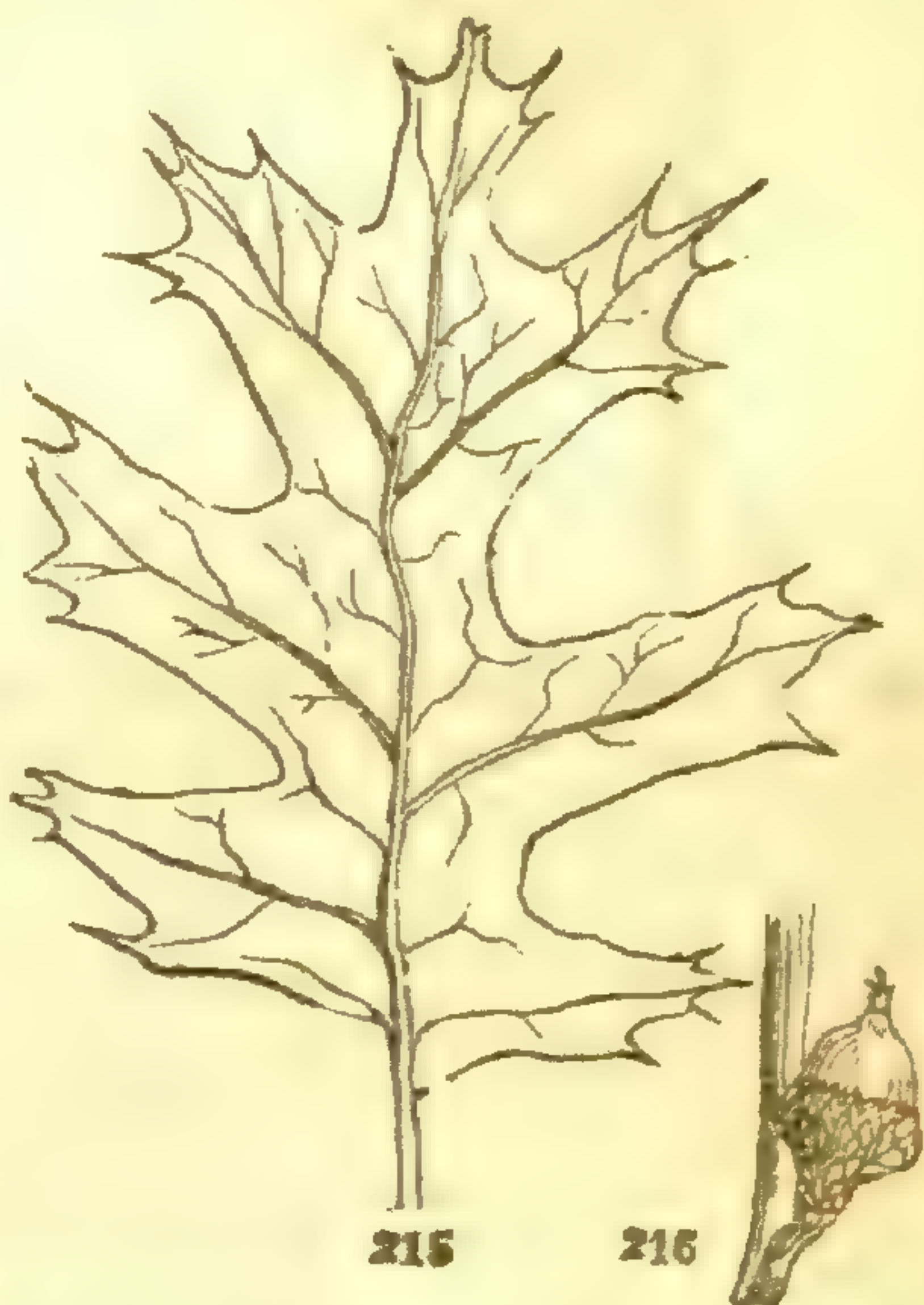
†† *Mature leaves glabrous on both sides, or nearly so.*

11. *Q. tinctoria*, Bartr. Leaves obovate-oblong, sinuate-lobed, more or less rusty-puberulent beneath when young; cup scaly, thick; acorn ovoid.

DYER'S QUERCUS. Black Oak. Quercitron. Yellow-barked Oak.

Stem 60–80 or 90 feet high, and 2–3 or 4 feet in diameter, with a thickish deeply-furrowed, dark-colored epidermis, and a spongy yellow inner bark. *Leaves* 6–8 inches long, obovate in their outline, more or less deeply sinuate-lobed (usually 3 principal lobes on each side), the base obtuse or sometimes cuneately tapering, smoothish above, the under surface clothed with short steelate or fasciculate hairs which present a pulverulent appearance; *petioles* 1–2 inches long. *Acorn* rather small, ovoid, seated in a subsessile cup, which is tapering at base.

Rich upland forests: common.



Obs. The wood of this species is not very durable,—neither is it much esteemed for fuel; yet, in consequence of its abundance, it is, or has been, very extensively used for fencing, firewood and shingles. The straight fibres, and facility of splitting the wood, no doubt recommended it for shingles. The inner bark is an article of commerce, under the name of Quercitron; and is exported in large quantities to Europe, where it is employed in dyeing yellow. It has nearly superseded the use of *Weld* (*Reseda luteola*, L.) in calico printing. The prevalence of this fine tree, in woodlands, is an indication of a good soil for Agriculture.

2. *Q. cocci'nea*, Wang. Leaves oval in outline, deeply sinuate-pinnatifid, with broad open sinuses, smooth and shining green on both sides; cup conspicuously scaly; acorn roundish-ovoid or globular.

FIG. 213. The Black Oak or Quercitron (*Quercus tinctoria*). 214. An acorn.
FIG. 215. The Scarlet Oak (*Quercus coccinea*). 216. An acorn.

CRIMSON QUERCUS. Scarlet Oak.

Stem 60 – 90 feet high, and 2 – 3 or 4 feet in diameter. *Leaves* 5 – 8 inches long, deeply lobed (usually 4 principal lobes on each side), the sinuses rounded and wider at bottom, the base obtuse or sometimes rather cuneate, both surfaces smooth and shining green, with a dense pubescence in the axils of the nerves beneath—finally becoming red and spotted with deeper crimson: *petioles* 2 – 4 inches long. *Acorn* roundish, depressed or slightly umbilicate at apex,—the lower half immersed in a rough scaly cup.

Rich moist woodlands. New England to Georgia.

Obs. The bark of this tree is much sought after by our Tanners, who (not being acquainted with the *Q. falcata*,) erroneously call it “Spanish Oak,” and give it the preference over all the other Oaks that are common here, for their business. The crimson leaves of this species, where it abounds, impart a gorgeous and magnificent appearance to our forests, in autumn; and it is really marvellous that a tree so handsome at all seasons, should be so rarely seen in the lawns and pleasure-grounds of persons of any pretensions to taste.



13. *Q. ru'bra*, L. Leaves oblong, smooth, sinuate-lobed, sinuses rather acute; lobes incised-dentate with the teeth very acute; cupule shallow, saucer-shaped, flat at base, nearly even on the outer surface; acorn rather large and turgidly oblong-ovoid.

RED QUERCUS. Red Oak.

Stem 60 – 90 feet high, and 2 – 4 feet in diameter. *Leaves* 5 – 8 or 9 inches long, often somewhat obovate, rather obtuse at base, sinuate-lobed (usually 3 principal lobes on each side), the sinuses shallower and more acute than in the preceding species; *petioles* 1 – 2 inches long. *Acorn* oblong-ovoid, plump and rather large, seated in a broad flat-bottomed

FIG. 217. The Red Oak (*Quercus rubra*). 218. An acorn.

saucer-like sessile *cup*, of which the scales are so compact as to present a smooth or nearly even surface.

Hilly woodlands : Northern and Middle States. *Fl.* May. *Fr.* October.

Obs. Justice to myself, and to the truths of Natural History—as well as to Mr. EMERSON, author of the admirable Report on the Forest Trees and Shrubs of Massachusetts,—requires that I should here rectify a misapprehension under which I labored when I compiled the first edition of this work. I had always understood (of course from others—having no personal knowledge of the subject,) that the bark of this species was in high repute with the Tanners,—and so stated. But on a more careful and particular inquiry of intelligent and practical men, in that business, I learn that it is regarded as being much inferior in value to the bark of *Q. cocci'nea*,—and am now satisfied that Mr. EMERSON is substantially correct in the statement that it is “almost worthless for the use of the Tanner.” The timber of this tree is also of inferior value.

14. *Q. palus'tris*, *Du Roi*. Leaves oblong, deeply sinuate-pinnatifid,



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with broad rounded sinuses, lobes divaricate, acutely dentate ; cupule saucer-shaped ; acorn subglobose, small.

MARSH QUERCUS. Pin Oak. Swamp Spanish Oak.

Stem 40–60 or 70 feet high, and 1–2 feet in diameter, with numerous rather slender horizontal or drooping branches, which are frequently very knotty. *Leaves* 4–6 inches

FIG. 219. The Pin or Swamp Spanish Oak (*Quercus palustris*.)

long, deeply lobed (usually 3 lobes on each side),—the lobes rather narrow, diverging, the base of the leaves obtuse or often somewhat cuneate, both surfaces smooth, except a tuft of pubescence in the axils of the nerves beneath; *petioles* 1–2 inches long. *Acorn* small (mostly numerous), seated in a smoothish shallow nearly flat-bottomed subsessile cup, which is often abruptly tapering from the centre of the base.

Wet low grounds, along rivulets, &c.: New England to Pennsylvania, and west to Illinois.

Obs. The wood of this Oak is very firm,—and is much employed by wheelwrights, &c. It is quite common in Pennsylvania,—but does not appear to extend to the South. It would seem as if the *Q. falca'ta*, and this species, were distinctly located in the two great divisions of the U. States. Four or five additional species, belonging to this group, are found in the U. States; but they are not very important,—and some of them are quite small and scrubby.

2. CASTA'NEA, *Tournef.* CHESTNUT.

[Named from a city of Thessaly (*Castanea*); famed for Chestnuts.]

STAMINATE FL. interruptedly clustered in long naked cylindrical spike-form *aments*. *Calyx* deeply 5–6-parted. *Stamens* 8–15; *anthers* 2-celled. PISTILLATE FL. usually in threes, within ovoid squarrose solitary or clustered *involucres*. *Calyx* adherent to the ovary,—the limb 5–6 lobed. *Stamens* 5–12, abortive, minute. *Ovary* 3–6 celled; *ovules* solitary, pendulous; *style* bristle-like; *stigmas* as many as the cells. *Fruit* a coriaceous prickly *involucre*, containing 1–3 nuts, and opening by 4 valves. *Nuts* ovoid when single, plano-convex or compressed when two or three,—1-seeded by abortion. *Cotyledons* thick, somewhat plicate and cohering together, sweetish and farinaceous. *Flowers* appearing after the leaves.

1. *C. ves'ca*, Leaves oblong-lanceolate, acuminate-serrate, with coarse pointed teeth, smooth on both sides; nuts usually 2–3 in each involucre.

EATABLE CASTANEA. Chestnut. Chestnut-tree.

Fr. Le Chataignier. *Germ.* Der Kastanienbaum. *Span.* Castaño.

Stem 60–80 or 90 feet high, and 2–4 or 5 feet in diameter. *Leaves* 6–9 inches long; *petioles* about half an inch long. *Staminate flowers* small, whitish or ochroleucous, in slender, pubescent interrupted spikes or *aments*, 4–8 inches in length,—the florets crowded in dense bracteate clusters; *stamens* long. *Pistillate flowers* mostly 3 together, in a scaly, squarrose ovoid involucre. *Involucre* usually solitary—sometimes 3–4 in a cluster—subsessile, enlarging, finally globose, about 2 inches in diameter, thickly covered with acute compound or coalesced prickles, opening at maturity by 4 valves or lobes, densely villous within. *Nuts* 3 (by abortion often 2 or 1), roundish-ovate, acuminate, reddish-brown, smooth below, the upper half covered with a greyish tawny pubescence; the middle nut flattened on both sides, the lateral ones convex or gibbous externally, and when the lateral ones are both abortive, the central one becomes roundish-ovoid.

Upland forests: throughout the United States. *Fl.* June. *Fr.* October.

Obs. The American Chestnut-tree is scarcely more than a variety of the European,—the chief difference being in the size of the fruit. The nuts of our native Chestnut-tree are smaller, and the kernels much sweeter, than those of the European variety—or “Spanish Chestnut,”

as it is commonly called. The wood of the Chestnut-tree is light, easily split, and rather brittle,—yet very durable; not esteemed for fuel, but highly valued for making fences. The tree is of rapid growth,—being speedily reproduced, by suckers from the stump, when cut off—and therefore well calculated to keep up a supply of fencing timber.

2. C. pu'mila, Mx. Leaves obovate-oblong, acute, serrate or denticulate, whitish-tomentose beneath; nut solitary, ovoid, small.

DWARF CASTANEA. Chinquapin.

Stem 6–10 or 12 feet high. *Leaves* 2–6 inches long, mucronately serrate or sometimes denticulate, green and smoothish above, clothed with a soft dense cinereous tomentum beneath; *petioles* about half an inch in length. *Staminate flowers* in aments, 1 or 2–4 inches long, slender and numerous. *Involucres* of the pistillate flowers in spikes, or clustered on short tomentose axillary branches or common peduncles, enlarging, finally globose, an inch or an inch and a half in diameter, pubescent and prickly, opening at summit with 4 lobes or valves. *Nut* (by abortion?) constantly solitary, small, ovoid, acute, dark brown, pubescent at summit.

Sterile soils: S. Pennsylvania to Florida. *Fl.* June. *Fr.* Oct.

Obs. This shrub is rarely seen north of Maryland. The kernels are remarkably sweet and pleasant to the taste, but are scarcely half the size even of our native Chestnut. The seeds of both Chestnuts and Chinquapin—and especially of the latter—are very subject to be preyed upon by worms.

3. FA'GUS, Tournef. BEECH.

[Latin,—from the Greek, *phago*, to eat; the fruit being esculent.]

STAMINATE FL. in globose long-peduncled pendulous clusters, with deciduous scale-like *bracts*. *Calyx* campanulate, 5–6-cleft. *Stamens* 8–12. **PISTILLATE FL.** usually in pairs, within an ovoid pedunculate *involucre*, which is formed of numerous united awl-shaped flexible *bracts*. *Calyx-lobes* 5–6, awl-shaped. *Ovary* 3-celled; *ovules* 2 in each cell; *styles* 3, filiform; *stigmas* lateral. *Nuts* acutely triquetrous, usually two in the leathery, softly prickly, 4-valved *involucre*. *Cotyledons* thick, fleshy, irregularly plicate. *Trees* with a thin, smooth, ash-colored *bark*, horizontal branches, long pointed *bulbs* and greenish-yellow *flowers*.

1. F. ferrugin'ea, Ait. Leaves oblong-ovate, taper-pointed, more or less toothed, ciliate; the scales of the involucre spreading or recurved.

FERRUGINOUS FAGUS. Beech Tree. American Beech.

Fr. Le Hêtre. *Germ.* Die Buche. *Span.* Haya.

Stem 40–80 feet or more in height, with a thin even-surfaced whitish bark. *Leaves* 3–5 inches long, penni-nerved, and plicate along the nerves while young, silky-pilose, finally smoothish on the upper surface; *petioles* one-eighth to half an inch long; *stipules* long, linear, membranaceous, tawny, caducous. *Aments* of staminate flowers very numerous, loosely subglobose, silky-pubescent, pale greenish-yellow, on slender silky-pilose peduncles an inch or an inch and a half long. *Involucres* of the pistillate flowers

fewer, on rigid axillary peduncles about half an inch long. *Nuts* pubescent, pale reddish brown.

Low moist woodlands : throughout the United States. *Fl.* May. *Fr.* September - October.

Obs. The density and uniform texture of the wood render it valuable for many purposes,—such as plane-stocks, and other implements of the mechanic arts. The leaves, especially of young trees, are remarkably persistent, after they are killed by frost, often remaining on the branches until late in the ensuing spring. The oily seeds afford a nutritious food for swine.

The Beech, although a symmetrical and pretty tree, is seldom cultivated in this country either for shade or ornament. And yet it would seem, from VIRGIL'S Pastorals, that in the land of *sweet do nothing* ("dolce far niente"), the Italian peasant of ancient times found an enviable enjoyment under its spreading branches :

———" *patulae recubans sub tegmine FAGI.*"

4. COR'YLUS, Tournef. HAZLE-NUT.

[Greek, *Korys*, a helmet, or cap ; in allusion to the involucrate fruit.]

STAMINATE FL. *Aments* cylindric, with imbricated bracteal scales. *Calyx* of two collateral scales beneath the bract, and all three united at base. *Stamens* 8 ; *anthers* 1-celled, subsessile, bristly at apex. PISTILLATE FL. from subterminal buds, in small clusters at the ends of the branches ; *involucre* of 2 - 3 (at first minute but subsequently enlarging) villous leaflets, which are lacerate on the margin and coherent at base, embracing 1 - 2 flowers. *Calyx* adherent to the ovary,—the *limb* very minute, denticulate, villous. *Ovary* 2-celled ; *ovules* solitary ; *stigmas* 2, elongated, filiform. *Nut* (by abortion) 1-seeded, roundish-ovoid, obtuse, subcompressed, bony, smooth, solitary in the enlarged foliaceous lacerate-dentate *involucre*. *Shrubs* : the flowers preceding the leaves.

1. C. AVELLA'NA, L. Leaves orbicular cordate, acuminate ; stipules ovate-oblong, obtuse ; involucre about the length of the fruit.

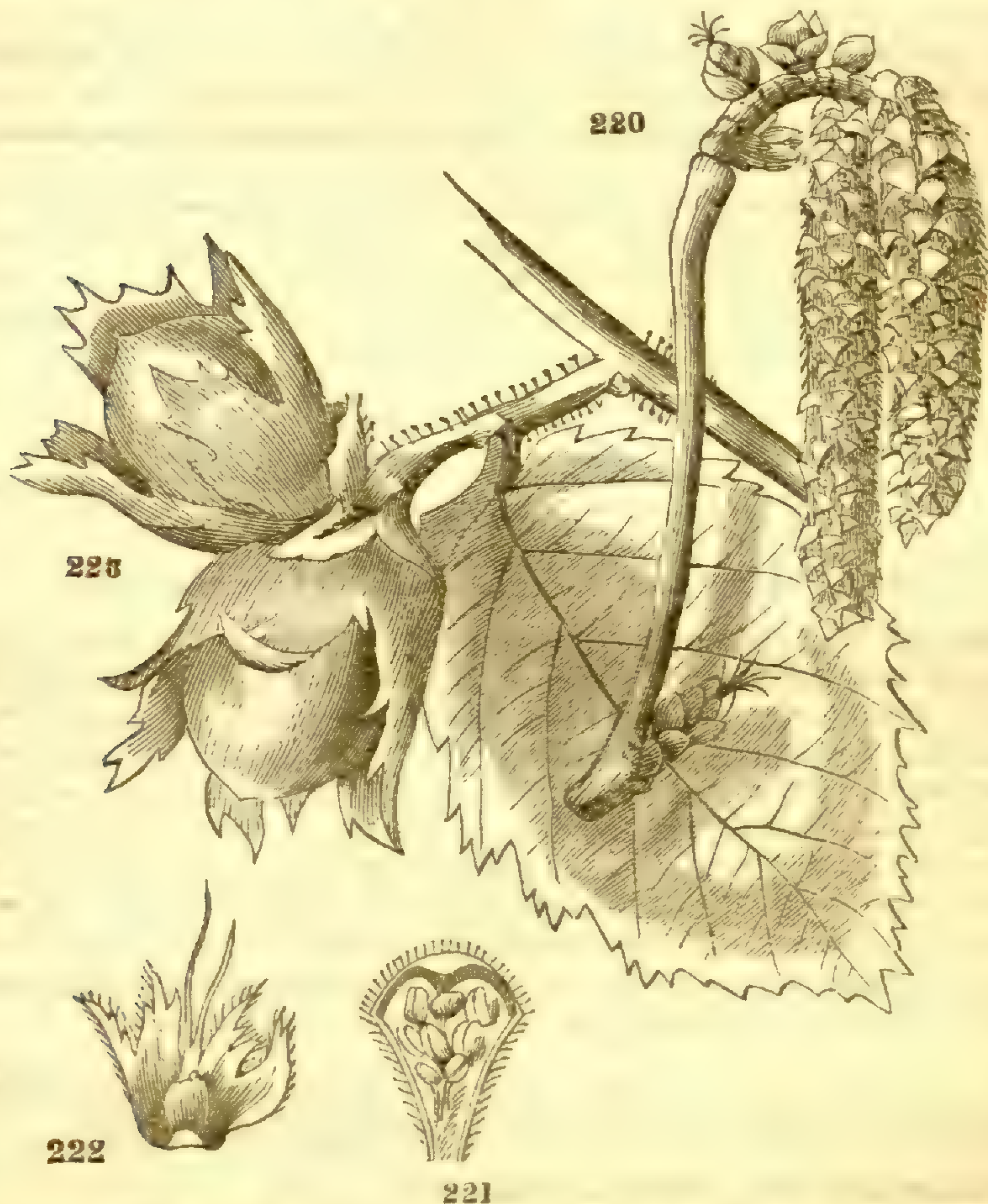
AVELLAN CORYLUS. Filbert. Hazle-nut.

Stem 6 - 10 feet high, branching from the base. *Leaves* 3 - 5 inches long, often obovate-cordate, doubly serrate ; *petioles* $\frac{1}{4}$ - $\frac{3}{4}$ of an inch in length. *Pistillate flowers* few in scaly clusters,—the *scales* (or *bracts*) enlarging, uniting and forming the *involucres*. *Stigmas* purple. *Nuts* rather large.

Yards, &c. Native of Asia Minor. *Fl.* March. *Fr.* Sept.

Obs. The Filbert, or Hazle-nut of the old world is now becoming known among us,—and not unfrequently cultivated. "The bushes were originally imported into Italy from Pontus, and [the fruit] known among the Romans by the appellation of *Nux Pontica*,—which, in the progress of time was changed into that of *Nux Avellana* ; from the

place [Avella, near Naples] where they had been most successfully propagated." The young forked twigs of this shrub constitute the celebrated divining rod with which certain imposters beyond the Atlantic pretend to discover the localities of precious metals and subterranean



fountains. The imposture, and the credulity on which it operated, have both reached our shores; but the Filbert not being indigenous here, a capital substitute was discovered in the Witch Hazel (*Hamamelis*)! The twigs of Peach trees also, have been found to answer the purpose nearly as well as the Witch Hazel; and thus the occult sciences of ore-

FIG. 220. A flowering branch of the cultivated Filbert or Hazel-nut (*Corylus Avellana*), the staminate flowers in long aments, the pistillate ones in small bud-like clusters. 221. A scale from the aments, showing the anthers beneath it. 222. A pistillate flower with the involucre spread open. 223. A branch in fruit, the nut surrounded by the enlarged leafy involucre.

finding, and water-smelling have been enabled, in some degree—even in this “progressive” age—to keep pace with the sublime mysteries of Clairvoyance, and Spiritual Rappings, as well as with the lucrative manufacture of Panaceas, and Indian Specifics. It is indeed both humiliating and discouraging to contemplate the facility with which a large portion of mankind can be made the dupes of such miserable trumpery.

2. C. America'na, Marshall. Leaves orbicular-cordate, acuminate; stipules ovate; involucre ventricose-campanulate, much larger than the nut, with the limb compressed, dilated, lacerately many-cleft.

AMERICAN CORYLUS. Hazle-nut. Wild Filbert.

Shrub. Stem 4–6 feet high, slender, branching,—the young branches virgate, pubescent and glandular-hispid. *Leaves* 3–6 inches long, varying from roundish-cordate to ovate and obovate, dentate-serrate, pubescent; *petioles* one-fourth of an inch to an inch long. *Stipules* ovate-lanceolate, caducous. *Aments* preceding the leaves, 1–2 inches long. *Pistillate flowers* in pedunculate squamose clusters,—the scales finally enlarging, uniting and forming the involucre of the nuts. *Nut* subglobose, somewhat compressed at apex, rather wider than long, finely pubescent, embraced by the subcoriaceous *involucre*, which is twice as long as the nut, glandular-hirsute externally, ventricose at base, with the limb bilabiate and irregularly lacerate-dentate.

Borders of thickets, fence-rows, &c. : throughout the United States. *Fl.* March – April. *Fr.* Sept.

Obs. This shrub is generally well known for its esculent seeds, though I believe it has never been thought worth while to cultivate it. There is another native species common northward, the Beaked Hazle-nut (*C. rostra'ta, Ait.*), which has the involucre prolonged into a bristly beak extending an inch beyond the nut.

5. CARPI'NUS, L. HORNBEAM.

[The ancient classical name.]

STAMINATE *Fl.* in lateral drooping *aments* with simple ovate scale-like *bracts*, without a proper *calyx*. *Stamens* 12 at the base of each bract; *anthers* 1-celled, hairy at apex. *PISTILLATE Fl.* in pairs, with small deciduous *bracts* and enlarging foliaceous 1-sided *involucres*, arranged in terminal loose *ament-like racemes*. *Ovary* 2-celled. *Stigmas* 2, filiform. *Nuts* in pairs, small, ovoid, sub-compressed, striate-ribbed, stalked, each with a 1-sided enlarged open and leaf-like *involucre*. *Scrubs* or small *trees* with obtusely and irregularly ridged trunks, a thin smooth ash-colored bark, and *flowers* preceding the leaves.

1. C. America'na, Mr. Leaves ovate-oblong, doubly serrate; involucre 3-lobed, sub-hastate, unequally cut-toothed on one side.

AMERICAN CARPINUS. Horn-beam. Iron Wood. Water Beech.

Stem 10–20 feet high, often branched from the root, and growing in clusters. *Leaves* 2–4 inches long; *petioles* $\frac{1}{4}$ – $\frac{1}{2}$ an inch in length. *Pistillate aments* 2–3 inches long. *Involucres* finally about an inch long. *Nuts* about 8-ribbed, smoothish, dark brown.

Margins of streams, &c. : common. *Fl.* April. *Fr.* Sept.

Obs. A tree of very slow growth, and does not attain to a very great size. It is readily distinguished by its peculiarly ridged trunk. The rich colors of its leaves in the fall add much to the variety and beauty of the autumnal scenery. The wood is exceedingly hard and close-grained, and is well suited for turned work, and for such purposes as require great compactness and solidity.

6. OS'TRYA, *Michel.* HOP HORNBEAM.

[Greek, *Ostreon*, a shell, or scale,—in allusion to the structure of the fruit.]

STAMINATE FL. nearly as in *Carpinus*. PISTILLATE FL. in terminal, loosely imbricated *aments* with small deciduous *bracts*. Scales of the involucre in pairs, hairy at base, membranaceous, uniting by their margins and enclosing 1–2 flowers. Ovary 2-celled; 2-ovuled, crowned with the entire and ciliate border of the *calyx*; stigmas 2, subsessile, elongated, filiform. Fruit in a *strobile* (or *cone*), formed of the scales of the involucre, which are membranaceous, nerved, and coalesced into *utricles* or little sacs. Nuts solitary within the utricles, compressed, ovate-lanceolate, smooth, 1-seeded. Slender trees, with brownish, slightly furrowed bark, and flowers appearing with the leaves.

1. O. *Virgin'ica*, *Willd.* Leaves ovate-oblong, acuminate, sharply serrate; cones ovoid-oblong; involucre thickly beset with tawny bristles at the base.

VIRGINIAN OSTRYA. Hop Horn-beam. Iron Wood. Lever-wood.

Stem 20–40 or 50 feet high, and 5–8 or 10 inches in diameter. *Leaves* 2–4 inches long on short petioles. *Staminate aments* an inch to an inch and a half long. *Pistillate aments* mostly terminal and solitary, 1 to near 2 inches long, slender and, while young, linear; flowers in pairs,—each pair subtended by an ovate-lanceolate tawny calucous bract; each flower contained in a membranaceous sac formed by the united scales of the involucre,—the sac enlarging and becoming a bladder-like envelope of the nut, slightly inflated, ovate, imbricated, and forming altogether, at maturity, a pedunculate pendulous cone, about the size of, and much resembling, the *Common Hop*.

Woodlands: New England to Carolina. Fr. April–May. Fr. Sept.

Obs. The wood of this small tree is remarkably firm and tough; and although neither very common nor very important, it may be well, perhaps, for the intelligent farmer to know what it is when he meets with it. According to Mr. EMERSON, it is known by the name of Lever-wood in New England.

ORDER LXVIII. MYRICA'CEÆ. (SWEET-GALE FAMILY.)

Shrubs with alternate, simple, resinous-dotted often aromatic, mostly stipulate leaves and monœcious or diœcious flowers in small aments,—the pistillate globose or ovoid; ovary 1-celled with a single erect ovule, surrounded by persistent scales; fruit a dry nut or sometimes drupe-like and covered with a waxy secretion; embryo without albumen.

1. MYRI'CA, *L.* BAYBERRY.

[The ancient name of some shrub.]

Flowers diœcious. STAMINATE FL. in oblong or cylindrical aments.

Stamens 2–8, filaments somewhat united below, beneath a scale-like bract with a pair of bractlets. *PISTILLATE FL.* in small ovoid aments, *Ovary* with 3 scales at its base and 2 thread-like stigmas. *Fruit* a small globular nut covered with wax-like grains. *Leaves* deciduous or evergreen, more or less serrate.

1. *M. cerifera*, L. Leaves oblong-lanceolate, toothed towards the apex or entire, shining and resinous—dotted on both sides; sterile aments loose, the bracts naked; fruit spherical, distinct.

WAX-BEARING MYRICA. Bayberry. Wax-myrtle.

Shrub 3–8 feet high, much branched. *Leaves* 2–4 inches long and from $\frac{1}{2}$ an inch to nearly an inch wide, pubescent underneath. *Flowers* appearing before the leaves are fully expanded. *Sterile aments* about $\frac{1}{2}$ an inch long. *Nuts* about the size of a pepper-corn encrusted with a whitish dry wax.

Sandy soil: along the Sea-coast and Lake Erie. *Fl.* May. *Fr.* Aug.–Sept.

Obs. The foliage of this shrub is, when bruised, pleasantly fragrant. In New England the wax which invests the berries is collected in considerable quantities; it is obtained by boiling the berries in water, when the wax melts and rises to the surface. Under the name of Bayberry Tallow it is often used, in the rural districts at the east, to make candles either alone or mixed with tallow; it is also employed in soap-making, and great quantities are consumed for an apparently insignificant use,—the stiffening of the ends of circular or solar lamp wicks. Another species, the Sweet Gale (*M. Gale*, L.), is also found along the borders of ponds, but it has no important uses. *Compto'nia aspleni-fo'lia*, Ait., the Sweet Fern—well known for its fern-like foliage and aromatic odor, belongs to this order. An infusion of the leaves is of reputed value in dysentery, and the dried leaves afford material for juvenile cigars.

ORDER LXIX. BETULA'CEÆ. (BIRCH FAMILY.)

Trees or shrubs with alternate simple leaves, deciduous stipules and monœcious flowers in scaly aments; bracts 2–3-flowered; involucre none; ovary 2-celled, 2-ovuled, becoming a compressed, often winged, dry and indehiscent 1-seeded nut.

1. BET'ULA, Tournef. BIRCH.

[The ancient Latin name.]

STAMINATE AMENTS with the scales peltate, bibracteolate, 3–flowered. *Calyx* a scale. *Stamens* 4; anthers subsessile, oblong, 1-celled. *PIS-TILLATE AMENTS* with the scales 3-lobed, imbricated. *Calyx* none. *Ovaries* 3 under each scale. *Stigmas* 2, filiform. *Nut* lenticular, samaroid or winged. Mostly trees with the outer bark separable in thin horizontal sheets, that of the small branches dotted. *Twigs* and *leaves* often aromatic.

* *Bark of the trunk* white: *petioles* slender: *fertile catkins* cylindrical, peduncled.

1. *B. al'ba*, var. *populifo'lia*,
Spach. Leaves triangular taper-
pointed, unequally serrate, smooth on
both sides.

POPLAR-LEAVED VARIETY OF THE
WHITE BETULA. White Birch.

Trunk 20 - 25 feet high with a chalky-white
bark and numerous slender branches. *Leaves*
2-3 inches long, heart-shaped or somewhat
truncate at base with a very long point; *peti-*
oles half the length of the leaves. *Fertile*
aments at first erect, but at length pendulous.
Poor soils. Maine to Pennsylvania along
the coast. *Fl.* April. *Fr.* August.

Obs. A very graceful tree growing
on the poorest soil. The wood,
though not of the first quality for
fuel, makes good charcoal. The
straight stems of the young trees
are used by farmers and gardeners
as supports for bean vines, and the
brushy tops are similarly used for pea vines.

2. *B. papyra'cea*, *Ait.* Leaves
ovate, acuminate, doubly serrate,—
the veins beneath hirsute, petioles
glabrous; lateral lobes of the fertile
aments short, sub-orbicular.

PAPER BETULA. Paper Birch. Canoe
Birch.

Stem 40 - 60 or 70 feet high, and 1 - 2 or 3
feet in diameter; branches slender or flexi-
ble,—the shining brown bark dotted with
white. *Leaves* 2 - 3 inches long; *petioles* about
half an inch long. *Pistillate aments* about an
inch long, pendulous on a peduncle three-
fourths of an inch in length.

New England and Canada. *Fl.* April - May.
Fr. July - August.

Obs. This tree is remarkable, as
furnishing, in its thin, firm and dura-
ble bark, the material of which
the Aborigines of our country made
their portable Canoes. Various
other articles—as boxes, baskets, &c.
are manufactured from the bark, which readily separates into thin



FIG. 224. The White Birch (*Betula alba*, var. *populifolia*)

FIG. 225. The Canoe or Paper Birch (*Betula papyracea*).

paper-like layers. The wood is valuable for some kinds of cabinet work, though it is not very durable, when exposed to the weather; that of the heart is reddish; the sap-wood white.

** *Bark of the trunk reddish-brown or yellowish: petioles short: fertile catkins ovoid oblong, scarcely peduncled.*



3. *B. ni'gra*, L. Leaves rhomboid-ovate, acute, doubly serrate, entire at base, pubescent beneath; scales of the fertile aments villous,—the lobes sub-linear, obtuse.

BLACK BETULA. Black Birch. Red Birch.

Stem 40 – 60 or 70 feet high, and 1 – 2 feet in diameter,—the young trees and branches with a smoothish cinnamon-colored bark, the outer layers of old bark exfoliating in thin revolute laminae or sheets. *Leaves* 1 – 4 inches long; *petioles* 1 fourth to 3 fourths of an inch in length; *stipules* small, oblong-lanceolate. *Staminate aments* 2 – 3 inches long, flexible and pendulous. *Pistillate aments* about an inch long, oblong, obtuse, on short peduncles; *scales* 3-cleft two-thirds of their length,—the segments equal, linear or spatulate-linear, obtuse. *Nut* compressed, ovate, with a membranaceous margin which is widest towards the base.

Low grounds; banks of streams: Massachusetts, Southward. *Fl.* April. *Fr.* Aug.

Obs. The timber is close-grained and durable when not exposed to the weather. The wood is said to be highly valuable as fuel. The virgate branches were famous instruments in the hands of pedagogues, of the olden time, in promoting good order and a close attention to study, among the rising generation, to which the poet PHILLIPS refers, when he sings of

“—— afflictive *Birch*

Cursed by unlettered idle youth.”

But “the march of mind,” in the present day, has rendered such auxiliaries nearly obsolete! The flexible twigs of this species,—instead of being used to stimulate idle boys to learn their lessons—are chiefly employed for making coarse brooms, to sweep streets and court-yards, in our cities.

FIG. 226. The Black or Red Birch (*Betula nigra*).

4. *B. len'ta*, *L.* Leaves cordate-oblong, acuminate, sharply serrate, hairy on the veins beneath; scales of the pistillate aments roughish-pubescent, — the lobes ovate-lanceolate, rather acute, prominently veined.

SOFT OR PLIANT BETULA. Sweet Birch. Cherry Birch.

Stem 30–60 feet high, and 1–2 feet in diameter; branches numerous, slender, pliable, smooth and dotted with small white scars. *Leaves* 3–4 inches long, thinnish, varying from ovate-oblong to obovate, mostly somewhat cordate, and often a little unequal at base—the upper surface sprinkled with long hairs—the margin and nerves beneath hairy; *petioles* about half an inch long; pilose. *Staminate aments* 2–3 inches long, larger than in the preceding species. *Pistillate aments* about an inch long, and two thirds of an inch in diameter; *scales* 3-cleft nearly half their length—the lobes prominently keeled and nerved, hirsutely ciliate. *Nut* compressed, elliptic-obovate, acute at each end, with a membranaceous margin which is broader towards the summit, and somewhat ciliate, but everywhere narrower than in the preceding.

Mountain forests: throughout the United States. *Fl.* April. *Fr.* August.

Obs. The wood of this species is colored reddish,—something like that of the Wild Cherry (*Cerasus serotina*, *DC.*); and it is used, like that, in making cabinet-ware, bedsteads, &c. The bark and young twigs are pleasantly aromatic,—and were formerly employed in domestic brewings, diet-drinks, &c. The Yellow Birch (*B. excel'sa*, *Ait.*), which is common northward, belongs in this group; it is readily distinguished by its yellowish silvery or pearly bark.

2. AL'NUS, *Tournef.* ALDER.

[The Latin name for the *Alder*.]

STAMINATE AMENTS somewhat clustered, cylindric, drooping, with the scales peltate, 5-bracteolate beneath, 1–3-flowered. *Calyx* 4-parted. *Stamens* 4, inserted at the base of the calyx-lobes, and opposite them; *anthers* 2-celled. PISTILLATE AMENTS with the scales imbricated, fleshy, 2-flowered. *Calyx* of 4 scale-like sepals, adhering to the base of the bracts, all persistent and becoming woody in fruit. *Ovaries* 2 under each scale, sessile, 2-celled; *ovules* solitary, pendulous; *stigmas* 2, filiform. *Nuts* angular, sometimes winged.

1. *A. serrula'ta*, *Willd.* Leaves obovate, sub-acuminate, doubly serrulate, smooth and green on both sides; stipules oval, obtuse.

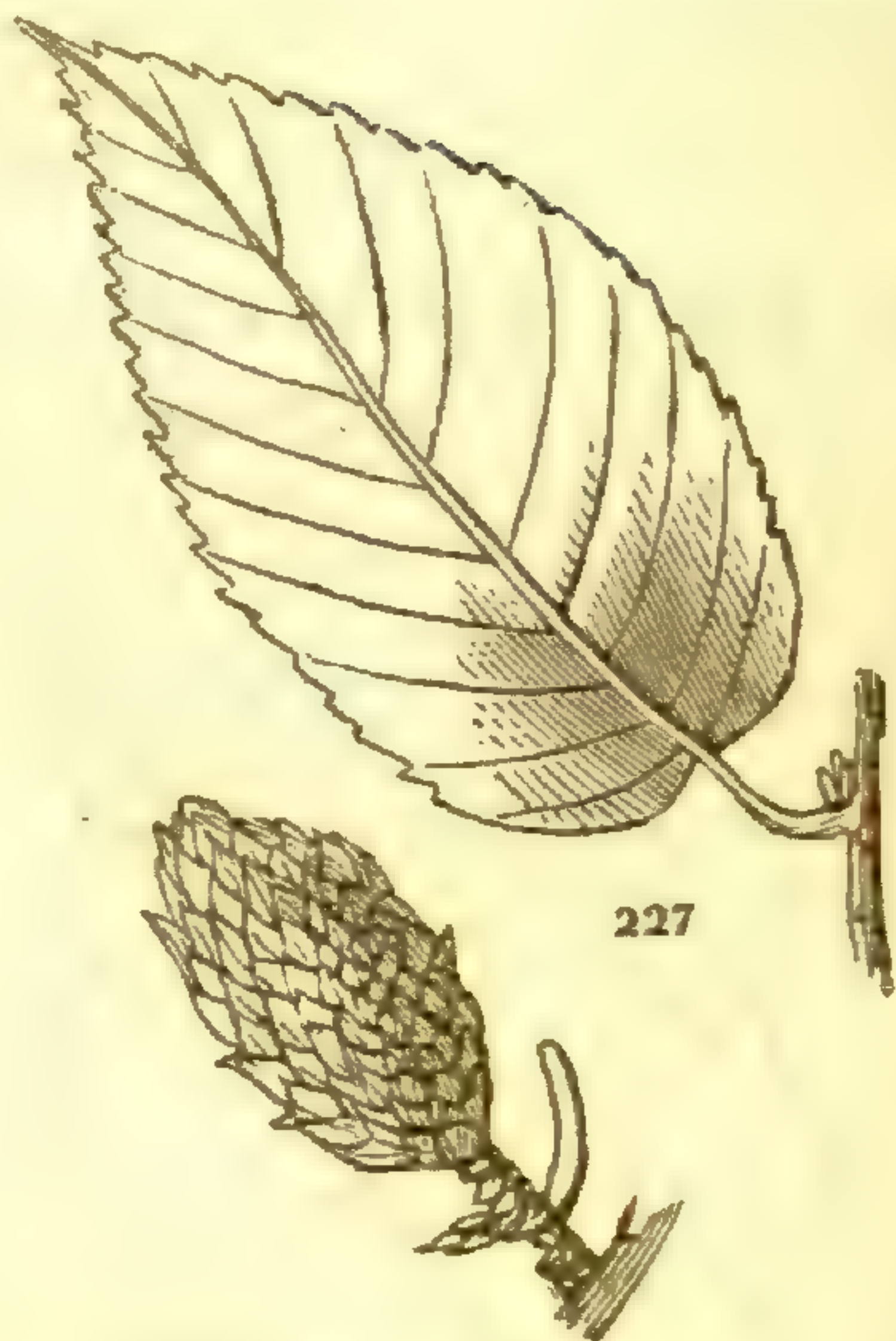


FIG. 227. The Sweet or Cherry Birch (*Betula lenta*).

SERRULATE ALNUS. Common Alder. Candle Alder.

Stem 3-10 or 12 feet high, and half an inch - 1 or 2 inches in diameter, with crooked and rather rigid branches. *Leaves* 2-4 inches long, strongly nerved, sub-plicate, thick and subcoriaceous, smoothish; *petioles* about half an inch long. *Staminate aments* one and a half to near 3 inches long, cylindrical, slender, flaccid, pendulous and sub-fasciculate near the ends of the branches; *scales* reddish-brown; *anthers* yellow. *Pistillate aments* half an inch to near an inch long, oblong, rigid, dark purplish-brown, persistent, on short lateral branches below the staminate ones—when in flower, bristled with the dark-purple exerted stigmas.

Swamps and margins of rivulets: throughout the United States. *Fl.* March - April. *Fr.* October.

Obs. This shrub is of little or no value,—and is only noticeable as a frequent intruder in swampy meadows, and along rivulets,—where, if neglected, the bushy growth soon gives the premises a slovenly appearance. It is true, the Alders often make a comfortable shade for the trout, in the little pools of our meadow rivulets; but the tidy farmer likes to keep even the margins of those streams clear of weeds and bushes. The Speckled Alder (*A. incana*, Willd.) is found in similar situations in New-England and northward. It is distinguished from the Common Alder by the polished appearance of its bark, and the whitened under surface of its leaves.

ORDER LXX. SALICA'CEÆ, (WILLOW FAMILY.)

Trees or shrubs, with alternate simple leaves, persistent and leaf-like or scaly and deciduous stipules and dioecious flowers in aments with 1-flowered bracts. *Calyx* and *corolla* none. *Stamens* 1-many. *Ovary* 1-celled, or imperfectly 2-celled, many-ovuled; *styles* 2, very short, or more or less united; *stigmas* 2-lobed. *Fruit* a 2-valved pod with numerous seeds, clothed with a long silky down.

1. SA'LIX, Tournef. WILLOW.

[The ancient classical name.]

Aments with the scales or bracts entire. **STAMINATE FL.** of 2-6 stamens accompanied by 1 or 2 little glands. **PISTILLATE FL.** with a small gland at the base of the ovary on the inner side; stigmas short. *Trees or shrubs* with numerous round flexible branches; leaves usually long and narrow, entire or glandular-serrate, from buds covered by a single scale.

* *Aments* appearing before the leaves, lateral and sessile: stamens 2.

1. *S. VIMINA'LIS*, L. Leaves linear lanceolate, very long and taper-pointed, white and satiny beneath; ovary sessile, long and narrow, woolly or silky.

Osier. Basket Willow.

A large shrub or small bushy tree, with long, straight and slender branches, the young twigs yellowish and pubescent. Leaves 3-6 inches long, of a satiny lustre beneath. *Aments* cylindrical ovoid, densely clothed with long silky hair.

Wet meadows and cultivated. Native of Europe. *Fl.* April.

Obs. This species, the common Osier of Europe, is cultivated to some extent for its long flexible branches which are wrought into baskets.

The most of the Osier used in this country is imported ; the labor required in peeling the twigs will probably prevent that raised in this country from successfully competing with the foreign article.

** Aments produced with the leaves at the summit of short lateral leafy branches, peduncled, long and loose : branches brittle at base.

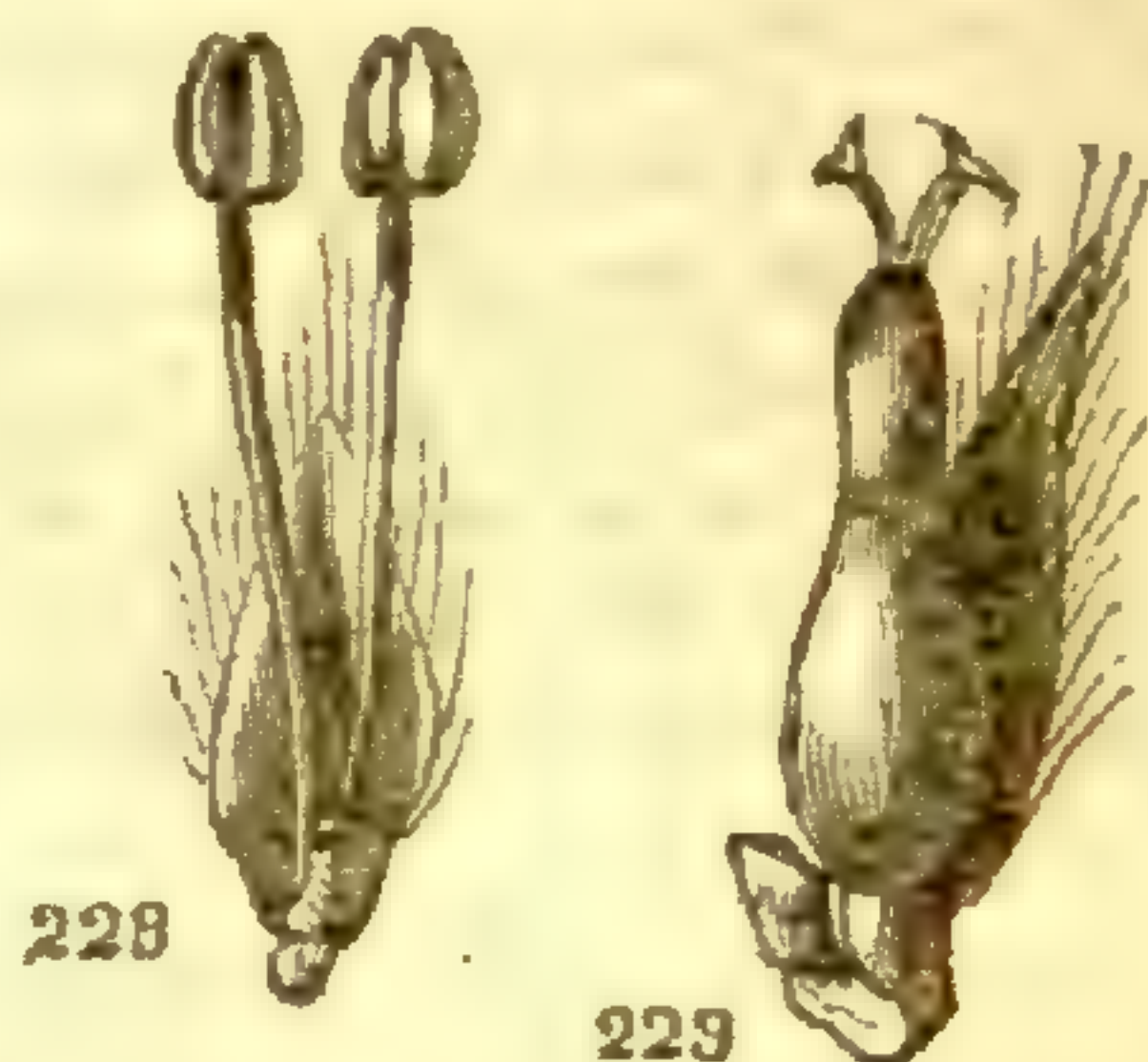
† Ovary sessile, smooth : stamens 2.

2. *S. al'ba*, L. Leaves elliptic-lanceolate, acuminate, denticulate, silky glaucous beneath ; stipules lanceolate ; styles short

WHITE SALIX. White Willow.

Stem 30 - 60 feet high, much branched ; branches rather erect, with a pale greenish-yellow bark. Leaves 2 - 4 inches long, the lower teeth glandular ; petioles 1 - 2 lines in length. Pistillate aments 2 - 3 inches long, greenish.

About houses, &c. Native of Europe. Fl. April.



Obs. The White Willow, if I mistake not, is the one which is preferred, and cultivated, by the manufacturers of Gun Powder, for the purpose of making charcoal. It was introduced as a shade tree about our old settlements, but is now generally superseded by the Weeping Willow. It is however partly naturalized in some localities. The var. *vitellina*,—Yellow Willow or Golden Osier,—has orange-yellow branches and rather shorter and broader leaves ; it is often seen, as a shade tree, and partly naturalized.

†† Ovary stalked, smooth : stamens 2 - 6.

3. *S. fra'gilis*, var. *Russelliana*, Carey. Leaves lanceolate, acuminate, serrate-dentate with the teeth incurved, somewhat glaucous beneath, and slightly silky while young ; stipules half heart-shaped ; styles conspicuous.

Brittle Salix. Bedford Willow.

Stem 30 - 50 feet high ; branches rather erect with a greenish-brown smooth bark, somewhat pubescent when young, remarkably brittle at base. Leaves 2 - 4 inches long, acute at each end, finally smooth ; petioles 2 - 6 lines in length, glandular and somewhat pubescent. Pistillate aments 2 - 2½ inches long. Pods tawny-green.

Low grounds. Native of England. Fl. May.

Obs. This is one of the species cultivated for basket work.

4. *S. BABYLO'NICA*, L. Young branches very slender, flaccid and pendulous ; leaves linear-lanceolate, acuminate, sharply serrulate or nearly entire ; stipules minute, ovate, glandular-dentate ; aments recurved.

BABYLONIAN SALIX. Weeping Willow. Drooping Willow.

FIG. 228. Staminate flower of the White Willow (*Salix alba*), consisting of two stamens with a gland at the base, borne on a scale of the ament. 229. A pistillate flower, an ovary with a gland upon a scale of the ament.

Stem 30–50 feet high, and 2–3 or 4 feet in diameter at base, widely branching above,—the young branches greenish, very numerous, slender, long and perpendicularly pendent. *Leaves* 2–4 or 5 inches long, narrow-lanceolate, the larger ones with a long acumination, smooth; *petioles* 1–2 lines long. *Pistillate aments* about an inch long, mostly ascending or turned up, on the pendulous branches; *scales* lanceolate, smooth.

About houses: introduced. *Fl.* April. *Fr.*

Obs. This elegant and interesting species—a native of the East—is deservedly admired, and much cultivated, as a shade tree. The pistillate plant, only, has been introduced to this country. Its specific name was given, by LINNÆUS, under the idea that it might be the tree so touchingly referred to in the 137th Psalm:—"By the rivers of Babylon, there we sat down; yea, we wept, when we remembered Zion. We hanged our harps upon the Willows in the midst thereof." There are many others of this difficult genus, mostly native species, abundant in low grounds; they are mostly low shrubs, and though great puzzles to the botanist, are of but little interest to the farmer.

2. POP'ULUS. *Tournef.* POPLAR.

[Latin, *Populus*, the people; the tree of the people; being used to shade public walks.]

Aments with laciniate or fringed bracts. *Calyx* subturbinate,—the limb oblique, lengthened in front, entire, surrounding the stamens or pistil. *Stamens* 8–12, or more;—the *filaments* free. *Stigmas* 2, elongated. *Capsule* 1-celled, 2-valved. *Trees* with more or less angular, often stoutish, branches; buds with numerous scales covered with a resinous varnish, and usually broad, more or less heart-shaped leaves on long laterally-compressed petioles. *Flowers* in long pendulous aments appearing before the leaves,—bracts and calyx similar in both kinds.

1. *P. tremuloides*, *Mx.* Leaves cordate-orbicular, abruptly acuminate, unequally dentate-serrulate, pubescent on the margin; bracts deeply 3–4-lobed, divisions linear.

TREMULA-LIKE POPULUS. American Aspen.

Stem 30–50 or 60 feet high, and 12–18 inches in diameter, with a smoothish cinereous bark. *Leaves* about 2 inches in length, and rather wider than long; *petioles* 2–3 inches long, slender, smooth, subterete towards the base, laterally compressed or vertically dilated near the leaf, which disposes the leaf to be agitated by the slightest motion of the air. *Pistillate aments* 3–4 or 5 inches long.

Low swampy grounds: Northern and Middle States. *Fl.* April. *Fr.* May.

Obs. This is a rather pretty tree,—and is occasionally planted about houses and lawns, for shade and ornament. It is admired for the extreme mobility of its leaves; and is, moreover, in considerable repute for the tonic properties of its bark. The large-toothed Aspen, or Large Poplar (*P. grandidentata*, *Mx.*) is common northward; it is a larger tree than the preceding and differs from it in having much larger, roundish and coarsely-toothed leaves, and the scales of the aments cut into 5 or 6 unequal small lobes.

2. *P. monilifera*. Ait. Leaves broadly deltoid, with spreading prominent nerves, slightly heart-shaped or truncate at base; scales lacerate fringed, not hairy.

NECKLACE-BEARING POPLAR. Cotton-wood.

Trunk 40–80 feet or more in height; the young shoots slightly angled. Leaves 2–3 inches long, and about the same width, serrate on the margin with cartilaginous, incurved and slightly hairy teeth. Stigmas nearly sessile, very large and dilated.

Margins of streams: especially Westward. April.



Obs. This tree has a wide range, being found from the Atlantic to the Pacific. This and other species are popularly known as Cotton-woods, and in many regions form almost the only timber. It gets its specific name from the resemblance of the long ament of ripened fruit to a string of beads or necklace. Another of the Cotton-woods of the West and South is *P. angulata*, Ait., which has its branches acutely angled or winged; both this and the preceding bear very large heart-shaped leaves, 7–8 inches in length on the young plants and suckers, while on the old trees they are only about one quarter that size and not often heart-shaped at base.

3. *P. GRÆ'CA*, Ait. Branches terete; leaves cordate-ovate, acuminate, obsoletely serrate, somewhat ciliate.

GRECIAN POPLUS. Athenian Poplar.

Stem 30–50 feet high, and 1–2 feet in diameter, with irregular and rather spreading branches. Leaves 4–6 or 8 inches in length, and as wide as long; petioles $1\frac{1}{2}$ –3 inches long, laterally compressed near the leaf. Pistillate aments 3–6 inches long.

About houses: cultivated. Native of Greece. Fl. April. Fr.

Obs. This species was introduced, as a shade tree, about 40 years ago; but it was not generally adopted,—and is now nearly superseded by more eligible ones. We have only the pistillate plant in this country;

FIG. 230. The Cotton-wood (*Populus monilifera*). 231. A fringed scale from a staminate ament. 232. Portion of a fertile ament.

and the cotton which is shed from the capsules is so abundant as to render the tree objectionable, in the immediate vicinity of dwellings. It is stated in SELBY'S History of British Forest Trees (1842) that the North American Continent is probably the "real native country" of this Poplar. If so, ARTON'S specific name (*Græca*) was an unfortunate misnomer; a mistake, however, not uncommon in vulgar names.

4. *P. DILATA'TA*, *Ait.* Leaves much dilated, nearly deltoid, acuminate, serrate, glabrous on both sides.

DILATED POPULUS. Lombardy Poplar. Italian Poplar.

Fr. Peuplier Italien. *Ger.* Lombardische Pappel. *Span.* Alamo de Lombardia.

Stem 60 – 80 feet high, and 1 – 2 or 3 feet in diameter; *branches* numerous, nearly erect, forming a close conical symmetrical top. *Leaves* 2–3 inches long, and wider than long; *petioles* about 2 inches long, laterally compressed near the leaf. *Staminate aments* 2–3 inches long.

About houses and along avenues: cultivated. Native of Italy. *Fl.* April. *Fr.*

Obs. This was a favorite ornamental tree, for a number of years; but a more correct taste has prevailed of late years, and we no longer see the long avenues of these stiff ungraceful trees that were formerly so common. Mr. WATSON, in his Annals of Philadelphia, says it was introduced to that city, from England, in the year 1784, by WILLIAM HAMILTON, Esq., of the "Woodlands," west side of the river Schuylkill. The Botanical Editor of Rees's Cyclopædia, however, thinks they have only the pistillate plant in England,—whereas it was the staminate plant that was introduced by Mr. HAMILTON; and he may have procured it from Italy. All the Lombardy Poplars that are, or have been, in the U. States, may be considered as elongations, branches, or offsets, of the tree from which Mr. HAMILTON obtained his specimen.

5. *P. AL'BA*, *L.* Leaves roundish heart-shaped, or often 3-lobed, coarsely toothed, smooth and green above, mostly white and densely tomentose beneath.

WHITE POPULUS. Silver Poplar. Abele-tree.

Stem 30 – 60 feet high, with spreading branches and smooth greyish-white bark. *Leaves* 2–3 inches long,—sometimes glabrous on both sides when old; *petioles* 1–2 inches in length. *Aments* 1–2 inches long, the *bracts* finely laciniate and ciliate with white hairs.

Obs. This species is often cultivated as a shade-tree. In point of beauty it bears no comparison with numbers of the natives of our own forest, while the numerous suckers which it sends up make it a real nuisance. Some of the grass-plats in the public squares of New York have been quite overrun by the wide-spreading suckers of this tree; even in closely-paved streets they work their way up between the stones. It should be discarded altogether.

The Balsam Poplar (*P. balsamifera*, *L.*) and its variety *candicans*, are found in the northern portions of the Union; they have their large buds covered with a fragrant resin or varnish. A tincture of the buds

is often made by the country people to apply to cuts and wounds, and is highly valued by those who like to see how such things will heal in spite of useless applications. The var. **candi'cans**, called Balm of Gilead, is frequently cultivated, as its fragrance in spring is exceedingly agreeable.

*

SUB-CLASS II.

GYMNOSPERMOUS EXOGENOUS PLANTS.

PISTIL represented by an open *scale* or *leaf*, or sometimes entirely wanting; the *ovules* and *seeds* consequently naked (i. e. without a proper pericarp); *style* and *stigma* none, fertilization taking place by a direct application of the pollen to the ovules. *Cotyledons* often more than two.

ORDER LXXI. CONIFERÆ. (PINE FAMILY.)

Trees or *shrubs* with *resinous juice*, needle shaped or awl-shaped *leaves* and monœcious or diœcious *flowers* in *aments*, without *calyx* and *corolla*. *Ovules* straight. *Embryo* in the axis of fleshy and oily *albumen*.

A valuable and very interesting Order of peculiar Botanical character, comprising some of the most magnificent trees known, and valuable for their timber as well as for their products, which include the turpentine, resins, pitch, tar, &c. The woody fibre of the plants of this order, under a high magnifying power, exhibits peculiar circular disks or markings.

PINE SUB-FAMILY.

Fertile flowers in aments, consisting of numerous persistent carpellary scales, each scale subtended by a bract; forming in fruit a strobile or cone. *Ovules* 2 at the base of each carpellary scale, their orifice turned downwards. *Seeds* winged. *Buds* scaly.

Leaves 2-5 in a cluster, from the axil of a thin scale, needle-shaped, evergreen.

Leaves all scattered on the branches, evergreen.

Leaves many in a cluster on side-spurs, and scattered along the shoots of the season, mostly falling in autumn.

1. PINUS.

2. ABIES.

3. LARIX.

CYPRESS SUB-FAMILY.

Fertile aments, consisting of a few carpellary scales, without bracts, with one or several erect ovules at their base. Fruit a roundish strobile or drupe-like. *Buds* naked.

* *Flowers* monœcious. *Strobile* dry, opening at maturity.

Fruit of few oblong nearly flat loose scales. *Ovules* 2. *Leaves* evergreen, scale-like, closely imbricated on the flattened branches.

Fruit woody and round; scales shield-shaped. *Seeds* 2 or more on the stalk of each scale. *Leaves* evergreen, scale-like or awl-shaped.

Fruit round and woody; scales shield-shaped and thickened. *Seeds* 2 on the base of each scale. *Leaves* falling in autumn, linear, 2-ranked.

** *Flowers* mostly diœcious. Fruit berry-like, not opening at maturity.

Fruit 3-6 coalescent 1-3-ovuled scales, becoming fleshy.

4. THUJA.

5. CUPRESSUS.

6. TAXODIUM.

7. JUNIPERUS.

YEW SUB-FAMILY.

Fertile flower solitary, consisting of a naked ovule ripening into a nut-like or drupe-like seed. Ovary entirely wanting. *Buds* scaly.

Ovule erect, surrounded at the base by an annular disk, which forms a berry-like cup around the nut-like seed. *Leaves* evergreen, linear.

Ovule, &c., nearly as in *Taxus*; leaves broadly deltoid, deciduous

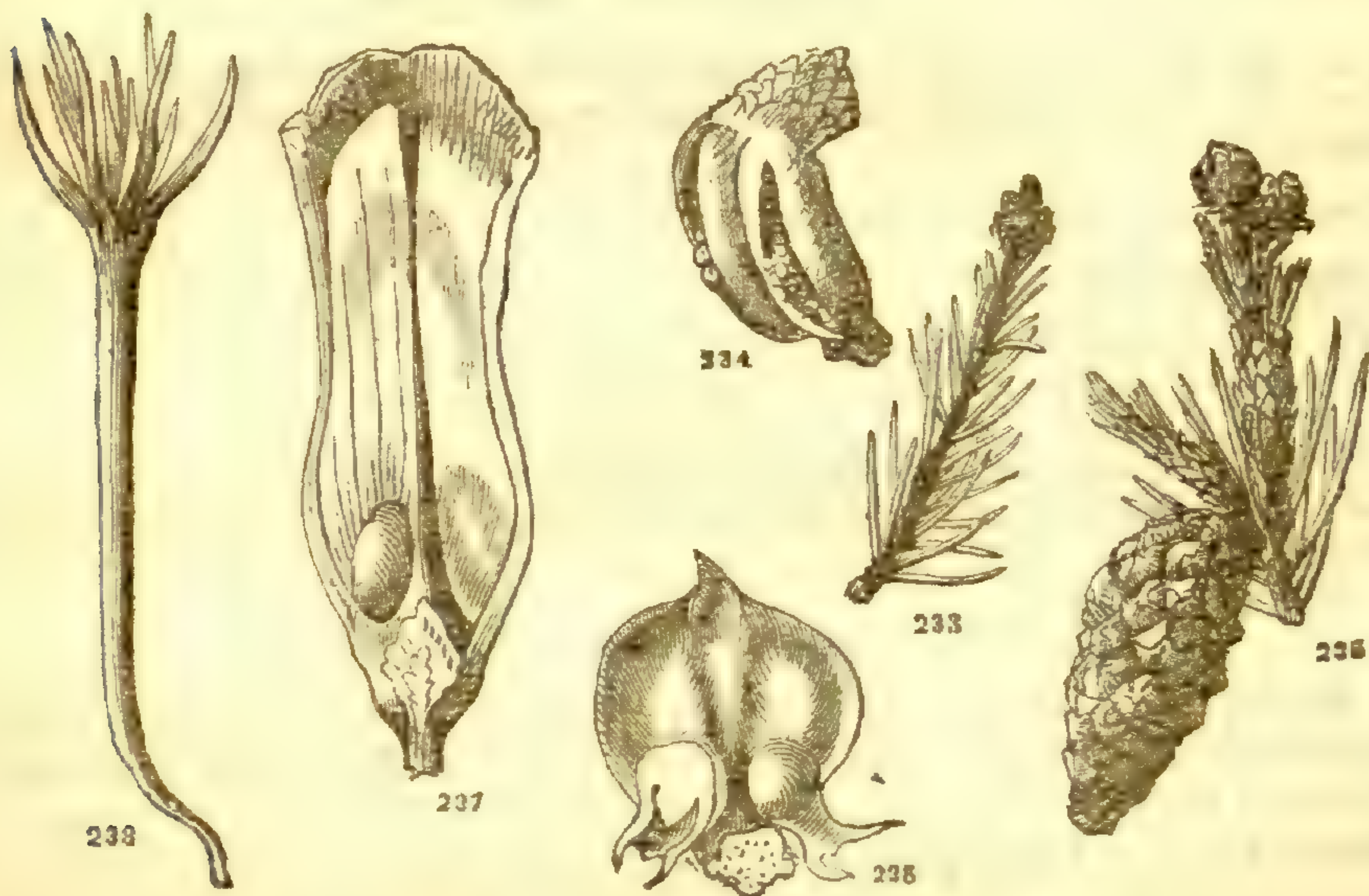
8. TAXUS.

9. SALISBURIA.

1. PI'NUS, L. PINE.

[The classical Latin name.]

Flowers monœcious. STAMINATE AMENTS clustered in terminal spikes. *Stamens* numerous, inserted on the axis; *anthers* subsessile, 2-celled, opening lengthwise, covered at apex by the dilated scale-like *connective*. FERTILE AMENTS solitary or clustered; the *carpellary* scales with deciduous *bracts* and each bearing a pair of inverted *ovules* at its base. *Fruit* a cone formed of the woody scales which are thickened at apex (except in the White Pines), persistent and spreading when ripe and dry; the *nut-like seeds* partly sunk in an excavation at the base of each scale, and *winged* by an adhering portion of its lining. *Cotyledons* 3–12, linear. *Trees* with leaves in bundles of 2–5, needle-shaped, each fascicle from the axils of a chaffy *scale*. Fruit generally maturing in the autumn of the second year after flowering.



* *Leaves* 2–3 (rarely 4) in a sheath: bark rough: cones woody, scales thickened at the end and mostly tipped with a spine.

† *Leaves* in twos, except in No. 3.

1. *P. in'ops*, Ait. Leaves rather short; strobiles oblong ovoid, often curved; spines of the scales slender and straight.

FIG. 233. A branch of a Pine with staminate aments at the top. 234. A stamen. 235. A branch with pistillate aments at the apex and the fruit (cone) below. 236. A scale from the fertile ament with two ovules at its base. 237. Scale from a ripe cone, with one of the two seeds removed. 238. The germinating embryo of a Pine, with several cotyledons.

POOR OR DESTITUTE PINUS. Jersey or Scrub Pine.

Stem 15–40 feet high, with straggling branches. *Leaves* $1\frac{1}{2}$ to near 3 inches long. *Staminate aments* oblong-ovoid, violet-purple. *Cones* 2–4 inches long. Barren hills, &c. New Jersey, southward.

Obs. The wood of this tree is said to be of but little value.

2. *P. resinosa*, Ait. Leaves from long sheaths, semi-cylindrical; scales of the cones pointless.

RESINOUS PINUS. Red Pine.

Trunk 70–80 feet in height and of a nearly uniform diameter for two-thirds of its length; the *bark* reddish. *Leaves* 5–6 inches long, dark green. *Cones* about 2 inches long, sometimes in clusters.

New England to Pennsylvania, north and west.

Obs. This tree is known in New England as the Norway Pine, a name which is applied in Europe to quite another tree. The wood is valuable, though less so than that of the Pitch Pine.

3. *P. mitis*, Mx. Leaves in pairs, often in threes, slender, channelled, from long sheaths; cones ovoid-conical, small; scales with a small, weak prickle.

SOFT PINUS. Yellow Pine (of the North).

Stem 40–60 or 80 feet high, and 1–2 feet or more in diameter, with the bark in rather broad flat scales. *Leaves* 3–5 inches long, slender, linear, dark green, mostly in pairs (sometimes in threes, on young branches). *Strobiles* (or cones) 2–3 inches long.

New England to Wisconsin and south; abundant in New Jersey.

Obs. This tree affords valuable lumber,—and is much employed in the construction of houses, and merchant vessels; but is much inferior in qualits to the Yellow Pine of the South.

†† *Leaves in threes, (rarely sometimes in fours.)*

4. *P. rigida*, Miller. Leaves rigid, from very short sheaths; cones ovoid-conical or ovate, often clustered; scales with a short and stout recurved prickle.

RIGID PINUS. Pitch Pine.

Trunk 30–60 feet high, rugged and knotty from the bases of fallen branches. *Leaves* 3–5 inches long, dark green, flattish. *Cones* 1– $3\frac{1}{2}$ inches long.

Sterile soil: New England, southward.

Obs. This species in barren and sandy districts forms woods where scarcely any other tree will grow. The wood is hard and filled with resin, and when it can be obtained free from knots, it forms valuable lumber for many purposes. It is used to some extent in ship building, and largely consumed as fuel,—especially for steam-engines.

5. *P. taeda*, L. Leaves long and rigid, with elongated sheaths; cones oblong; the scales with a short incurved spine.

Loblolly or Old Field Pine.

Trunk 50–100 feet high, with a thick, coarse, deeply-furrowed bark. *Leaves* 6–10 inches long, light green. *Cones* 2–5 inches long.
Virginia and southward.

Obs. A much more abundant and less valuable tree than the next; its wood containing much less resin. According to Elliott, "its seed is dispersed so easily and so universally over the country, that all lands which are thrown out of cultivation are immediately covered with this tree."

6. *P. palustris*, L. Leaves fasciculate in threes, very long; scales of the branches pinnatifid, portions of them persistent; strobiles elongated, conoid,—the scales armed with small recurved spines.

MARSH PINUS. Yellow Pine (of the South). Long-leaved Pine.

Stem 80–100 feet high, and 2–3 or 4 feet in diameter, with a smoothish bark—the branches rough with the persistent remains of the stipules (stipules ramentaceous). *Leaves* 9–15 inches long. *Strobiles* 6–9 inches long.

Sandy soils: Virginia to Florida. *Fl.* April. *Fr.* August–September.

Obs. This is a most important and valuable species. It yields the firmest and most durable lumber, for house and ship building, of any of the genus. The superior "heart-pine" boards, for flooring, &c., and the string pieces for railroads (where a wooden superstructure is used), are furnished by this tree. "From the sap of the living tree," says Mr. ELLIOTT, "most of the turpentine of commerce is obtained." Tar is procured by charring the wood and roots of this, and other species, by a smothered fire, which melts the turpentine and mixes it with the sap and juices of the wood. Pitch is the residuum, left by boiling tar until the watery portion is driven off. The ground where this tree prevails, becomes thickly covered by the long leaves—which the Southern people call straw.

* * *Leaves in fives: bark smooth: scales of the cones neither thickened nor prickly-pointed at the end.*

7. *P. Strobus*, L. Leaves scarcely sheathed at base, long and slender; strobiles oblong, sub-cylindric, nodding.

White Pine. Weymouth Pine. New England Pine.

Stem 60 or 80–120 feet or more in height, and 2–4 or 5 feet in diameter, straight and with a smooth bark—especially while young; *branches* verticillate, slender, rather few and those near the summit when the trees are crowded. *Leaves* 3–5 or 6 inches long, linear, bluish or glaucous-green. *Strobile* 3–5 inches long, somewhat curved; *scales* cuneate-obovate.

Rich soils, bottom lands, along streams, &c.: Canada to Virginia. *Fl.* May. *Fr.* Aug.–September.

Obs. This is also a most valuable tree,—furnishing an immense amount of lumber, in the form of boards and scantling,—and, of late years—since the Cypress has become somewhat scarce and dear—it is extensively wrought into shingles. Being fine-grained, and comparatively free from turpentine, the White Pine is much used for the interior wood-work of houses—except floors,—for which purpose it is rather soft.

2. A'BIES, *Tournef.* SPRUCE. FIR.

[The classical Latin name.]

Staminate aments scattered, or clustered near the ends of the branchlets. *Cones* with thin and flat *scales*, not thickened nor spine-pointed at the apex. *Seeds* with a persistent wing. *Trees* with solitary, scattered, short and rather rigid evergreen *leaves*, which are frequently 2-ranked.

* *Cones* lateral, erect, the *scales* falling from the axis at maturity: *leaves* flat, becoming 2-ranked, white underneath, blunt or notched at the apex.

1. *A. balsa'mea*, *Marshall*. *Leaves* narrowly linear; *cones* cylindrical, large; *bracts* obovate, serrulate, mucronate, slightly projecting, appressed.

BALSAMIC ABIES. Balsam Fir. Balm of Gilead Fir.

Trunk 40 – 60 feet high, with symmetrical branches, forming a conical top; *bark* smoothish, containing numerous small sacs or blisters, filled with a transparent liquid resin. *Leaves* about $\frac{3}{4}$ of an inch long, light green above. *Cones* 3–4 inches long and about an inch broad, violet purple; the *scales* broad, rounded, thin and handsomely imbricated.

Cold woods and swamps; northward.

Obs. A quick-growing but short-lived tree, which is very handsome when young, but becomes rugged and unsightly when old. It is frequently cultivated about houses, for ornament, and is easily transplanted. The resinous liquid which is contained in the blisters in the bark, known as Canada, or Fir Balsam, is procured by puncturing the reservoirs and catching the liquid as it exudes; it is very transparent, and of a syrupy consistence, and is employed in making delicate varnishes, and to a limited extent in medicine. The wood of the tree is of but little value. The nearly related *A. Fraseri*, *Pursh*.—the Double Balsam Fir—is found in Pennsylvania, and southward upon the mountains; it differs from the foregoing, in its smaller fruit, 1 – 2 inches long—which has oblong wedge-shaped bracts, with projecting and reflexed points; it also yields balsam. *

* * *Cones* terminal, hanging: *scales* not falling from the axis.

† *Leaves* flat, 2-ranked, whitened beneath.

2. *A. Canaden'sis*, *Mx.* Young branches slender, drooping; *cones* elliptic-ovoid, small.

CANADIAN ABIES. Hemlock Spruce. Hemlock.

Stem 40 – 60 or 70 feet high, and 1 – 2 or 3 feet in diameter, but tapering rapidly near the top, with long horizontal or often rather depending branches, which are slender and flaccid while young. *Leaves* half an inch to three quarters in length, shining green above, bluish-glaucous beneath. *Staminate flowers* in small roundish-ovoid pedunculate aments, which are racemously arranged around, and near the ends of the slender branches. *Strobiles* terminal, somewhat pendulous, about an inch long, bluish-glaucous when young, finally pale brown or ferruginous; *scales* obovate, concave, with the apex rounded, thin and entire.

Mountains and rocky banks, along streams: throughout the United States. *Fl.* May. *Fr.* August – September.

Obs. This tree is so generally diffused throughout Northern America that it has been adopted, as emblematic, in Vignettes on maps, and other devices, having reference to the country. It does not, however, afford a very valuable timber,—though frequently sawed into scantling, and other lumber. The bark is much used, in the Northern States, in the process of tanning; and MARSHALL informs us, that the Aborigines used it to dye their splints, for baskets, of a red color. The tree bears pruning well, and makes a very excellent hedge or screen for the protection of delicate plants, in those localities where strong winds prevail.

†† *Leaves 4-angled, equally distributed around the branch.*

3. *A. EXCEL'SA, DC.* Branchlets pendulous; cones cylindrical, very long; scales rhomboid, somewhat wavy on the edge and slightly lacerate at the tapering apex

TALL OR LOFTY ABIES. Norway Spruce or Fir.

Trunk 60–80 feet or more high. *Leaves* about an inch long, scattered but inclined to be 2-ranked. *Cones* 5–9 inches long, nearly cylindrical, light brown; *seed* with one edge of the wing a little thicker, like a maple key.

Cultivated. Native of northern Europe.

Obs. This stately solemn-looking tree, with its numerous dark green waving branchlets is now much planted for ornament, and is said to flourish better than most of our native species. The Burgundy Pitch of the shops is believed to be furnished by this species.

4. *A. ni'gra, Poir.* Leaves short, rigid, dark green; cones ovate or ovate-oblong; scales with a thin wavy eroded edge.

BLACK ABIES. Black Spruce. Double Spruce.

Trunk 30–60 feet or more high, with a handsome conical top. *Leaves* $\frac{1}{2}$ – $\frac{3}{4}$ of an inch long. *Cones* 1–2 inches long.

New England and northward.

Obs. Cultivated as an ornamental shade tree. The young shoots are used to give the flavor to Spruce Beer; a thick decoction obtained by boiling the branches in water, is sold for the same purpose under the names of “Essence of Spruce.” The White Spruce (*A. alba, Mx.*), also known as Single Spruce, is sometimes cultivated; it has longer cones with the scales entire and firm on the edge, and a lighter colored foliage. It is by some considered a variety of Black Spruce. Both kinds afford a valuable timber, much employed in ship building, especially for the lighter spars, when toughness, lightness and elasticity are required; it is also used in the construction of houses.

3. *LA'RIX, Tournef.* LARCH.

[The ancient name.]

Aments lateral, scattered and bud-like. STAMINATE FL. nearly as in *Pinus*. *Cones* erect, ovoid; *scales* persistent. *Seeds* with a persistent

wing. *Leaves* deciduous and soft or evergreen and rigid, the primary ones scattered, the secondary many in fascicles. *Fertile aments* crimson or red in flower.

* *Leaves rigid and evergreen.*

1. *L. CE'DRUS*, *Miller*. *Leaves* rather few in the fascicles, needle-form, pointed; strobiles oval, obtuse, rather large.

CEDAR LARIX. Cedar of Lebanon.

Stem 30–50 or more feet high. *Leaves* $\frac{1}{2}$ an inch to an inch in length. *Cones* 3–4 inches long; *scales* broad, truncate, closely appressed.

Cultivated. Native of Syria.

Obs. This noble tree—so well known for the references to it in the sacred volume—has been recently introduced, and bids fair to become common in cultivation. The Deodar Cedar—a graceful evergreen, with drooping branches, less rigid and rather longer bluish-green glaucous leaves—has also been introduced: and apparently belongs to this section.

** *Leaves soft and deciduous.*

2. *L. America'na*, *Mx.* *Leaves* thread-like; cones ovoid, of few rounded scales which are slightly inflexed on the margin.

AMERICAN LARIX. American or Black Larch. Hackmatack. Tamarack.

A slender tree, 20–50 feet high, with numerous nearly horizontal, irregular branches. *Leaves* about an inch long, of a light bluish-green. *Cones* about half an inch long.

Canada to Virginia. *Fl.* May.

3. *L. EUROPE'A*, *DC.* *Leaves* flattish; cones oblong with the scales slightly reflexed on the margin.

EUROPEAN LARIX. Larch. White Larch.

Stem 60–80 or more feet high. *Leaves* an inch or more in length. *Cones* about an inch long, purple while young, finally reddish-brown.

Cultivated. Native of Europe. *Fl.* May.

Obs. The European and American Larches much resemble each other, but the former is a handsomer tree with somewhat longer leaves and larger cones. The timber of both kinds is highly valuable, being strong, heavy and durable. It is much employed in ship building. The European species is of the most rapid growth and much attention is paid in Europe to its cultivation, and it might be advantageously planted on many unproductive lands in our country.

4. *THU'JA*, *Tournef.* ARBOR-VITÆ.

[The ancient Greek name of some resinous tree.]

Aments terminal, ovoid, small *monœcious*, the two kinds on different branches. *Stamens* with a scale-like connective or filament, bearing

4 *anther-cells*. FERTILE AMENTS with the *scales* imbricated, fixed by the base, each bearing 2 erect *ovules*, dry and spreading at maturity. *Cotyledons* 2. *Leaves* evergreen, very short, appressed and imbricated on the flattened branches.

1. *T. occidenta'lis*, *L.* Branches spreading ; leaves closely appressed, rounded on the back ; cones ovoid-oblong, scales obtuse, pointless.

WESTERN THUJA. American Arbor-Vitæ.

Stem 20–50 feet high, with a conical top ; young *branches* 2-edged, diverging horizontally. *Cones* half an inch long, in racemose clusters on the recurved branchlets ; *scales* 1-seeded ; *seed* broadly winged.

New England and northwest.

Obs. This is a native of the cooler parts of the country and is frequently cultivated as an ornamental evergreen. In the North it is regarded as a valuable tree for its timber, which is very durable, though difficult to procure of any great length.

2. *T. orienta'lis*, *L.* Branches erect ; leaves slightly sulcate in the middle ; cones roundish-ovoid or obovoid, erect ; scales acute with conspicuous recurved or spreading points.

EASTERN THUJA. Chinese Arbor-Vitæ.

Stem 10–20 feet high, usually of a shrub-like habit, with numerous erect branches from near the base—especially when young ; *branches* diverging vertically or fan-like, with the edges up and down. *Cones* sub-solitary, about half an inch long, deep green and glaucous.

Cultivated. Native of China and Japan.

Obs. This is a much smaller tree than the preceding, its foliage and cones of much deeper green. It is often used for an ornamental hedge ; and it is decidedly better for show than for service.

5. CUPRES'SUS, *Tournef.* CYPRESS.

[The classical name.]

Flowers monœcious on different branches, in terminal small *aments*. STERILE AMENTS of shield-shaped *scales* bearing 2–4 *anther-cells* under the lower margin. FERTILE AMENTS globular, of shield-shaped *scales* in 4 ranks, bearing several erect bottle-shaped *ovules*. *Cones* globular, firmly closed, but opening at maturity ; the scales thick and woody, pointed in the middle ; the few or several narrowly-winged seeds attached to their base or stalk. *Cotyledons* 2–3. Strong-scented evergreen trees, with very small and scale-like closely appressed imbricated leaves and exceedingly durable wood.

1. *C. thyoï'des*, *L.* Leaves minute, ovate, with a small gland on the back, closely imbricated in 4 rows on the 2-edged branchlets.

THUJA-LIKE CUPRESSUS. White Cedar.

Stem 30–80 feet high, and 1–2 feet in diameter, sparingly branched. *Leaves* evergreen, very small and crowded, appressed to the branches. *Strobiles* one third to half an inch in diameter.

Swamps and pine forests : New England to Georgia. *Fl.* April–May. *Fr.* September



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Obs. This valuable tree is restricted to swamps,—where the straight stems are exceedingly numerous and crowded—forming almost impenetrable dark groves, or clumps, of several acres. The wood is light, soft, and very durable. Shingles were formerly made, to a considerable extent, from the larger trees : but these are now chiefly wrought into domestics wares, by the Cedar cooper. The smaller trees are used for fence rails,—for which purpose they are highly valued. There is perhaps no other wood land that will yield so much valuable timber per acre,—and no description of territory, in some localities, that will command half the price that can be obtained for good Cedar swamp.

6. TAXO'DIUM, Richard. BALD CYPRESS.

[*Taxus*, the yew, and *eidos*, form ; the foliage having the habit of that plant.]

Flowers monœcious, on the same branches. STAMINATE AMENTS numerous, arranged in a terminal pyramidal spike or raceme. *Stamens* few, inserted towards the apex of the axis, which is naked at base ; *filaments* short, thick, produced into a scale-like excentrically peltate *connective* bearing 2–5 *anther-cells*. FERTILE AMENTS roundish-obovoid, sessile in pairs at the base of the staminate spike ; *scales* numerous, inserted on the axis, imbricated, acute, recurved-spreading at apex. *Ovules* 2 at the base of each scale, sessile, erect, perforate at summit. *Cone* subglobose, formed of angular subpeltate woody scales. *Seeds* angular ; *embryo* in the axis of scanty albumen ; *cotyledons* 6–9.

1. *T. dis'tichum*, Rich. Leaves flat, pinnately arranged on short slender deciduous branches which resemble common petioles.

DISTICHOUS TAXODIUM. Cypress. Bald Cypress.

FIG. 239. A scale from a staminate ament of Cypress (*Cupressus*), with the anthers at its base. 240. A scale from a pistillate ament, with numerous ovules at its base. 241. A cone.

Stem 80–100 feet high, fastigiately branched at summit; the trunk 2–4 feet, or more, in diameter, often abruptly and much enlarged at base; the creeping or spreading *roots* protruding a number of large conical hollow *knobs* above the surface of the ground. *Leaves* one-third to half an inch long, sublinear, acute, pinnately or distichously arranged on alternate slender herbaceous branches (which rather resemble *common petioles*) 1–2 or 3 inches in length; a number of leaves are also solitary, and scattered on the woody branches.

Swamps, along large streams: Delaware to Louisiana. *Fl.* Feb.–April. *Fr.* Sept.–October.

Obs. The wood of this noble and remarkable tree is soft, fine grained and exceedingly durable. For many years it supplied the market with those valuable roofing materials called “Cedar shingles”; but since these have become rather scarce and dear, they have been extensively superseded by shingles made of the White Pine (*Pinus Strobus*, L.), which make a reasonably good substitute at a much less price.

7. JUNIP'ERUS, L. JUNIPER.

[The classical name.]

Flowers dioecious,—or rarely monoecious on distinct branches. STAMINATE AMENTS axillary or subterminal, ovoid, very small. *Anther-cells* 3–6, attached to the lower edge of the shield-shaped *scale*. FERTILE AMENTS axillary, ovoid, bracteate at base; *scales* fleshy; in *fruit* forming a sort of *berry*, scaly-bracted at base, 1–3-ovuled. *Seeds* 1–3, angular, bony. *Cotyledons* 2. *Shrubs* or *trees* with awl-shaped or scale-like evergreen rigid *leaves*, often of two kinds.

1. *J. commu'nis*, L. Leaves in threes, linear-awl-shaped, spreading, prickly-pointed, concave and glaucous above.

COMMON JUNIPERUS. Juniper.

Stem 6–10 feet high, with numerous erect branches or prostrate and spreading. *Leaves* $\frac{1}{2}$ – $\frac{3}{4}$ of an inch long, sharp-pointed, bright green beneath. *Staminate aments* 2–3 lines in length, russet-colored. *Fruit* a dark purple, about the size of a pea.

Dry rocky hills: New Jersey and northward.

Obs. This shrub is common both to Europe and this country; there are several varieties, the most common with us is the prostrate form. The long branches extend in every direction, close to the surface of the earth, forming large beds 10–15 feet in diameter and not more than two feet high. In some parts of New England where it abounds, it is a troublesome plant, as it is very difficult to extirpate it; it is commonly destroyed by burning. The berries are used to flavor Gin, or Geneva, and the oil from them is sometimes used in medicine. *

2. *J. Virginia'na*, L. Leaves in four rows,—on young plants and rapidly growing shoots, awl-shaped and somewhat spreading in pairs and threes—on the older ones very small and scale-like, triangular-ovate.

VIRGINIAN JUNIPERUS. Red Cedar.

Shrubby, or a small tree, 20 – 50 feet high ; bark of the trunk separating in loose scales or ribbons, that of the small branches purplish and smooth. Berries small, purplish, with a glaucous bloom.

Common on dry hills.

Obs. This tree, which is common in all parts of the country, is one of the most widely extended in geographical range, it being found also in Europe and Asia ; in high northern latitudes it becomes a prostrate shrub. The wood is exceedingly durable, very light and close-grained ; the heart wood is red, and is used in making lead pencils ; it is also used for the manufacture of pails and tubs, and is employed in ship and boat building. *

8. TAX'US, *Tournef.* YEW.

[Probably from the Greek, *Taxon*, a bow ; the wood being used for bows.]

Flowers mostly dioecious, axillary, from scaly buds. STAMINATE AMENTS globular, small, composed of naked *stamens* ; *anther-cells* 3 – 6, clustered under a shield-shaped and somewhat lobed *connective*. FERTILE FLOWERS solitary, scaly-bracted at base, consisting merely of a solitary naked *ovule* seated in a cup-shaped *disk* which finally becomes pulpy and *berry-like*,—sometimes nearly enclosing the seed. *Cotyledons* 2. *Leaves* ever-green, linear, rigid, mostly 2-ranked ; *pulp* of the disk orange red.

1. T. BACCA'TA, L. A low tree, finally with a large trunk ; leaves acute, nearly flat, deep green, two-ranked or sometimes crowded round the branches.

BERRIED TAXUS. Common Yew.

Stem (in this country) but a few feet high ; *branches* numerous and spreading. *Leaves* $\frac{1}{2}$ – $1\frac{1}{4}$ inch long, mostly two-ranked.

Cultivated : Native of Europe. *Fl.* April. *Fr.* Oct.

Obs. Frequently cultivated in rural cemeteries and church-yards. A variety called the Irish Yew has compact branches and densely crowded leaves. We have an indigenous Yew which was formerly considered as a distinct species, but is now regarded as a variety of this, viz. : var. **Canaden'sis**, Gray. A low diffusely branching shrub ; leaves two-ranked.

American Yew. Ground Hemlock.

Stem 2 – 4 feet high, with straggling branches. *Leaves* $\frac{1}{2}$ – $\frac{3}{4}$ of an inch long, entire, dark green on both sides, narrowed at base into a very short petiole.

Common northward and southward on the mountains.

9. SALISBU'RIA, *Smith.* GINGKO.

[Dedicated to *Anthony Salisbury* ; an English Botanist.]

STAMINATE AMENTS axillary, filiform, pedunculate ; *anther-cells* pendulous from the lacerated scale-like *connective*. FERTILE FLOWERS terminal solitary, on simple or fasciculately branching *peduncles* ; *ovule* naked,

seated in a cup-shaped *disk* in the thickened concave apex of the peduncle,—the disk finally becoming fleshy, embracing the base of the nut-like seed. *Cotyledons* 2, linear, elongated. *Trees*; *leaves* plicately involute in the bud, deciduous, alternate or somewhat fasciculate, on long petioles, fan-shaped and striate-nerved, more resembling *phyllodia* than true leaves.



1. *S. adiantifo'lia*, Smith. Leaves broadly wedge-shaped and truncate, or inversely deltoid, often bifidly incised at the apex, coriaceous and striate with diverging nerves.

ADIANTUM-LEAVED SALISBURIA.
Gingko, or Jinkgo.

Stem 40–80 feet high, with a light grey bark, and branching, with something the habit of an Aspen. *Leaves* 2–3 inches long and 3–4 inches wide at apex; *petioles* about 3 inches in length.

Cultivated: a native of Japan.

Obs. A remarkable tree, and very unlike the rest of the family in its general appearance. For a long time there was but one specimen in the country, but it is now becoming frequent in cultivation.

ENDOGENOUS PLANTS.

STEM not distinguishable into *bark*, *wood*, and *pith*; the woody fibre and vessels collected into bundles and irregularly distributed through the cellular tissue; perennial stems without annual layers. *Leaves* mostly parallel-veined and sheathing at base, almost always alternate or scattered, and not toothed. Parts of the *flower* usually in threes. *Embryo* with a single *cotyledon*.

ORDER LXXII. ARA'CEÆ. (ARUM FAMILY.)

Perennial herbs with an acrid or pungent *juice*, simple or compound *leaves*, with *petioles* sheathing at base, and monœcious or perfect *flowers* crowded on a *spadix*, which is usually surrounded by a *spathe*. *Floral envelopes* none or of 4–6 sepals. *Fruit* usually a berry; *seeds* with fleshy *albumen*, or sometimes a large fleshy *embryo*, without *albumen*.

1. ARISÆ'MA, Martius. INDIAN TURNIP.

[A play upon Arum, the ancient name.]

Flowers monœcious, with the pistillate below on the same *spadix*,—or

FIG. 242. A branch of the Gingko or Jinkgo Tree (*Salisburia adiantifolia*).

dicœcious by abortion. *Spadix* naked and elongated above. *Floral envelopes* none. STAMINATE FL. of whorls of 4 or more *stamens*; *filaments* very short; *anthers* 2 – 4 celled. PISTILLATE FL. consisting of a 1-celled *ovary* with a depressed *stigma*, containing 5 – 6 straight *ovules*, erect from the base of the cell. *Fruit* 1 – few-seeded; *seeds* subglobose, albuminous. *Perennial herbs* with a tuberous *rhizoma*; *leaves* dissected; *petioles* elongated; *spadix* on a *scape*; *berries* orange-red.

1. A. triphyl'ium, Torr. Leaves mostly in pairs, ternately divided,—the segments elliptic-ovate or lanceolate, acuminate, entire, sessile; *spadix* clavate, obtuse, shorter than the spathe.

THREE-LEAVED ARISÆMA. Indian Turnip.

Root perennial, consisting of numerous fibres proceeding from the base of an orbicular depressed rugose *cormus*, or subterranean stem. *Aerial stem* none. *Leaves* mostly 2 (sometimes solitary), ternate; the *leaflets* or segments 2 or 3 – 6 or 8 inches long, smooth, green or often purplish, thin and membranaceous, or almost scarious, when dried; *common petioles* 9 – 18 inches long, inserted on the *cormus*, and embracing the central *scape* at base. *Scape* 6 – 15 inches high, situate between the leaves, the base inclosed by the sheathing *petioles*. *Spathe* 3 – 5 inches long,—the lower half convolute, the upper half (or limb) a little dilated, flat, ovate-lanceolate, acuminate, and cucullately incurved, often variegated with dark-purple and yellowish stripes and spots. *Spadix* mostly unisexual, with the summit clavate, naked and smooth, much shorter than the spathe, but a little exerted from the convolute portion. *Berries* numerous, in a dense oblong cluster around the base of the *spadix*, orange-red or scarlet when mature.

Rich shaded grounds: throughout the United States. *Fl.* May. *Fr.* August – September.

Obs. The turnip-like subterranean stem (designated by the name of *Cormus*), is highly acrid in its fresh or green state; but that quality is dissipated, in a great measure, by boiling or drying. The recent tuber, grated and boiled in milk, is a popular medicine in coughs and pulmonary consumption. It is said to yield a starch equal in quality to that from the potato, and a substance called *Portland Arrowroot*, or *Portland Sago*, is prepared from it in some parts of England. A plant nearly allied to this, called “Tanyer”—(the Tallo, or Tarro, of the New Zealanders), is said to be cultivated, occasionally, in the gardens of the Southern States, for the sake of the *cormus*, or tuberous *rhizoma*,—which is used at the table as a substitute for the potato or yam.

2. SYMPLOCAR'PUS, Salisb.

[Greek, *Symploke*, connexion, and *Karpus*, fruit; descriptive of the plant.]

Flowers with *floral envelopes*, perfect. *Spathe* conch-shaped, acuminate. *Spadix* pedunculate, oval, or subglobose, densely covered with flowers. *Sepals* 4, persistent, becoming fleshy or baccate. *Stamens* 4, opposite the *sepals*; *filaments* linear, flattened, included; *anthers* 2-celled. *Ovary* 1-celled; *ovule* single; *style* 4-sided, tapering to a minute terminal *stigma*. *Berries* coalescing, 1-celled, 1-seeded. *Seed* destitute of albumen.

1. S. fœ'tidus, Salisb. Stemless; leaves cordate-oval, enlarging; *spadix* oval.

FETID SYMPLOCARPUS. Swamp Cabbage. Skunk Cabbage.

Root perennial, with fleshy fibres from a thick truncate *rhizoma*. *Aerial stem* none. *Leaves* appearing after the spadix has flowered, at first orbicular-cordate, at length cordate-oval, becoming very large (often near 2 feet long, and a foot or more in width), entire, smooth; *stipules* expanding, ovate-oblong, acuminate, or often spatulate. *Spathe* subsessile, spotted with purplish-brown, green, and yellow. *Spadix* about an inch in diameter, on a short thick peduncle. *Flowers* compact, appearing tessellated. *Sepals* dark-brown, fleshy, cuneate, truncate, the apex and margins inflected. *Anthers* slightly exserted. *Style* projecting a little above the sepals. *Fruit* fleshy, coalesced with the base of the persistent sepals, and imbedded in the surface of the receptacle. *Seeds* globose, about the size of a common garden pea.

Wet, low grounds: Canada to Virginia. *Fl.* Feb. – March. *Fr.* Sept.

Obs. This plant—so readily known by its skunk-like odor, when wounded—is quite common in wet meadows, and other swampy low grounds in the middle and northern States. It is a worthless weed,—and its bunches of large leaves are sufficiently unsightly to command the attention of the neat farmer.

3. AC'ORUS, L. SWEET FLAG.

[Gr. *a*, privative, and *kore*, the pupil of the eye; a supposed remedy for sore eyes.]

Flowers perfect, without a proper *spathe*, crowded on a sessile sub-cylindric *spadix* which emerges from the side of a *scape* which closely resembles the leaves. *Sepals* 6, concave. *Stamens* 6, inserted on the base of the sepals; *anthers* reniform 1-celled, transversely dehiscent. *Ovary* trigonous, 3-celled; *ovules* numerous, pendulous; *stigma* sessile, minute. *Fruit* somewhat baccate, indehiscent. *Seeds* few, inverted, albuminous, nestling in a gelatinous matter.

1. A. Cal'amus, L. Scape leaf-like, extending much above the lateral *spadix*.

REED ACORUS. Calamus. Sweet Flag.

Fr. Acore odorant. *Germ.* Der Kalamus. *Span.* Acoro Calamo.

Root perennial, in coarse verticillate fibres from a horizontal creeping pungently aromatic *rhizoma*. *Aerial stem* none. *Leaves* radical, ensiform-linear, 2–3 feet long, and half an inch to near an inch wide, smooth. *Scape* as long as the leaves and much resembling them, somewhat triangular below the spadix. *Spadix* 2–3 inches long, terete, tapering to an obtuse point. *Sepals* greenish, cuneate-oblong, keeled, with scarious margins.

Swampy meadows, about springs, &c. *Fl.* May – June. *Fr.* Sept.

Obs. A native of Europe and Asia as well as some parts of this country. The whole plant is warmly aromatic—especially the creeping *rhizoma*; and that subterraneous portion is deservedly popular for its medicinal virtues. I have seen some wet meadows, however, in which the plant had got possession to such an extent as to become something of a nuisance,—and a difficult one to get rid of. It would be well, therefore, in introducing it, to plant it only in circumscribed swamps.

ORDER LXXIII. TYPHA'CEÆ. (CAT-TAIL FAMILY.)

Marsh herbs, with linear or narrow-ensiform leaves, sheathing at base, and monœcious flowers, destitute of proper floral envelopes in a dense cylindric spadix-like spike or glomerate in heads. *Fruit* nut-like when ripe, 1-seeded. *Seed* suspended; *embryo* straight, in copious albumen.

1. TY'PHA, Tournef. CAT-TAIL.

[Greek, *typhos*, a bog or marsh; from its place of growth.]

Flowers in a long dense terminal cylindric interrupted spike with an intervening caducous spathe,—the upper portion consisting of stamens only, intermixed with simple hairs,—the lower portion consisting of ovaries surrounded by numerous clavate bristles; style simple. *Nutlets* minute, stalked. Smooth *perennials* with creeping rhizomas, and simple jointless stems and long narrow, thickish, erect leaves which nearly equal the culm.

1. *T. latifo'lia*, L. Leaves somewhat ensiform-linear, flat; staminate and pistillate spikes mostly contiguous.

BROAD-LEAVED TYPHA. Cat-tail. Coopers' Reed. Reed-mace.

Fr. Masse d'eau. *Germ.* Die Rohrkolbe. *Span.* Espadaña.

Culm 4–5 feet high, simple, terete, smooth, solid with pith, leafy at base. *Leaves* about as long as the culm, and $\frac{1}{3}$ – $\frac{2}{3}$ of an inch wide, tapering at apex but obtuse, sheathing the culm at base. *Staminate spike*, or spadix, 6–8 inches long, and near an inch in diameter, yellowish-brown, with a sheathing membranaceous caducous spathe as long as the spike. *Pistillate spike* immediately below (and about as thick as) the staminate one, 4–6 inches long, greenish brown, sometimes in contact or continuous with the staminate spike, sometimes with a naked space of near half an inch between them.

Pools and swampy springs: throughout the United States. *Fl.* June–July. *Fr.* September.

Obs. The leaves of this plant are (or formerly were) much used, by the coopers, to secure the joints of casks, &c., from leaking. Poor people sometimes collect the fruit with its hairy involucels, from the mature spikes, for the purpose of filling beds; but it becomes exceedingly dusty and unpleasant, and is even unhealthy,—in every respect a miserable substitute for clean Oats chaff, or cut straw. A narrow-leaved variety, by some considered a species (*T. angustifolia*, L.), is found in similar situations; it usually has the staminate and pistillate portions of the spike separated by an interval.

ORDER LXXIV. ALISMA'CEÆ. (WATER-PLANTAIN FAMILY.)

Marsh herbs with scape-like stems and perfect or monœcious flowers, not on a spadix, furnished with both calyx and corolla; sepals and petals each 3, distinct. *Stamens* hypogynous, 6–many. *Ovaries* 3–many, becoming as many 1–2-seeded pods or akenes. *Seeds* ascending or erect. *Embryo* without albumen. *Leaves* sheathing at base.

1. SAGITTA'RIA, L. ARROW-HEAD.

[Latin, *Sagitta*, an arrow; from the prevailing form of the leaves.]

Flowers monœcious (sometimes diœcious), mostly whorled in threes, the

staminate ones above. *Calyx* green and persistent. *Petals* white, deciduous, imbricated in the bud. *Stamens* numerous; *anthers* extrorse. *Ovaries* many, in depressed-globose heads, in fruit becoming flattened winged *akenes*. Smoothish *perennials*; *roots* often tuberiferous; *leaves* polymorphous, usually sagittate; *scape* sheathed at the base by the bases of the long cellular petioles.



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1. *S. varia'bilis*, *Engelmann*. Scape simple or branched; leaves very various, mostly sagittate; pedicels of the fertile flowers about half the length of the sterile ones; filaments awl-shaped, nearly twice the

FIG. 243. The Arrowhead (*Sagittaria variabilis*).

length of the anthers; akene obovate, with a long and curved beak $\frac{1}{3}$ or $\frac{1}{2}$ its length.

VARIABLE SAGITTARIA. Arrow-head.

Root perennial producing oval fleshy tubers (or *rhizomas*) 1–2 or 3 inches in diameter. *Leaves* 3 or 4–8 or 10 inches long (including the lobes), and 1 or 2–6 inches wide, sagittate-lobed at base,—the *lobes* ovate-lanceolate, about as long as the lamina of the leaf; *petioles* 4–12 or 15 inches long. *Scape* 9–18 inches high, smooth. *Pedicels* one quarter to half an inch long, with membranaceous *bracts* at base. *Pistillate flowers* with ovaries forming depressed globose *heads*, which, in fruit, are one-half to two-thirds of an inch in diameter.

Ditches and swampy springs; throughout the United States. *Fl.* July–August. *Fr.* September–October.

Obs. This plant frequently occurs in ditches and swampy places, and is of a size to attract the notice of the observing farmer. Some half-dozen varieties, founded on the variation in size and shape of the leaves, are described. KALM says that the Indians and Swedes called the plant “*Katniss*”; and that the tubers were sometimes “as big as a man’s fist”; that when roasted, they tasted well, but were rather dry. (See *Travels*, vol. 2, pp. 96, 97.) Hogs are fond of the tubers,—and when these animals have access to their place of growth, are apt to disfigure the ground very much by rooting. Draining is the remedy for this, and for most other aquatic weeds.

The *Alisma Plantago*, L., or Water Plantain, (belonging to a genus which represents the Order,) is frequent in wet places,—and at one time made some noise among gossiping dealers in marvellous specifics, as a certain remedy for Hydrophobia; but it was soon forgotten,—and is now scarcely noticeable, even as a weed.

ORDER LXXV. BROMELIA'CEÆ. (PINE-APPLE FAMILY.)

Chiefly tropical *herbs* or suffruticose plants, often stemless with perennial *rhizomas* and mostly by rigid, dry and channelled *leaves* sheathing at base and scurfy or scaly on the surface. *Flowers* perfect, spicate, racemose, or paniculate, bracteate. *Sepals* 3. *Petals* 3. *Stamens* 6, or more. *Ovary* free, or adnate to the calyx, 3-celled; *style* trigonous, simple or sometimes separable into 3; *stigmas* 3. *Fruit* 3-celled, baccate and indehiscent, or more frequently capsular and septicidally (or sometimes loculicidally) 3-valved. *Seeds* mostly numerous; *testa* coriaceous; *embryo* small, straight or curved, in the base of mealy albumen.

The plant of chief interest, in this Order, is that which affords the delicious Pine-apple; the fruit of which is formed by the consolidation or blending of the imperfect flowers, bracts, and receptacle into one fleshy succulent mass, which is usually crowned with a terminal tuft of leaves.

1. TILLAND'SIA, L. Long Moss.

[Named in honor of *Elias Tillands*, a Swedish Botanist.]

Calyx free from the ovary, unequally 3-parted, persistent,—the segments somewhat convolute. *Corolla* 3-cleft, tubular below, spreading above. *Stamens* 6, hypogynous,—the alternate ones mostly adhering to the petals; *anthers* incumbent. *Ovary* 3-celled; *style* filiform or dilated at apex, straight or twisted. *Capsule* cartilaginous, cylindrical or ovoid,

3-celled, 3-valved. *Seeds* several, linear-clavate, stipitate,—the stipe invested with pappus-like hairs; *embryo* straight.

1. *T. usneioides*, L. Stem filiform, flexuose, branching, pendulous; leaves subulate-filiform; peduncles 1-flowered, short.

USNEA-LIKE TILLANDSIA. Long Moss.

Perennial, parasitic, taking root in the fissures of the bark of trees. *Stem* 3–6 feet or more in length, branched, pendulous in long tangled bunches from the limbs of old trees, very slender, terete, covered and somewhat roughened (as well as the leaves) with minute whitish membranaceous scales which are dotted in the centre,—the centre of the stem and leaves consisting of a black horny elastic thread. *Leaves* subterete, slender, acute. *Flowers* yellowish-green, Pursh. (purple, Loudon, Ency.), solitary, axillary, sessile, with 3–4 small leaves (or bracts) at base. *Calyx* and *corolla* deeply parted,—the segments equal in length, lanceolate, membranaceous. *Ovary* oblong. *Capsule* nearly cylindrical, 2–3 celled. *Seeds* several in each cell, oblong, acute at each end, comose.

Grows on the forest trees, in the low-land districts of the South. Fl. June–Sept. Fr.

Obs. This singular parasite extends as far north as the Dismal Swamp, in Virginia; but I have not had the pleasure of seeing it in its native forests. Mr. ELLIOTT (from whose sketch I have chiefly derived the above details) says, “black cattle eat this plant in winter with avidity, and sometimes trees are felled, during a series of severe frosts, to place the moss within their reach. The moss, when dried, is beaten until the bark falls off, and the cartilaginous hair-like flexible stem used for stuffing mattresses, chairs, &c.” The uses, here mentioned, seem to entitle the plant to a place in the present work.

ORDER LXXVI. SMILA'CEÆ. (SMILAX FAMILY.)

Herbs or climbing shrubby plants with ribbed and netted-veined leaves and regular diœcious or perfect flowers. *Perianth* 6–10 parted; *stamens* as many as the perianth-lobes. *Ovary* free, 3–5-celled; *styles* or sessile stigmas many and distinct. *Fruit* a few-many-seeded berry; *embryo* minute, in a hard albumen.

1. SMILAX, Tournef. GREEN-BRIER.

[The ancient Greek name, meaning obscure.]

Flowers diœcious, in axillary pedunculate simple umbels. *Calyx* somewhat corolla-like, campanulate, deeply 6-parted,—or rather of 6 petaloid sepals in two series, the outer ones broader. STAMINATE FL. *Stamens* 6; *anthers* linear, adnate to the filaments. PISTILLATE FL. *Ovary* 3-celled; *ovules* solitary; *stigmas* 3, subsessile. *Berry* 1–3-celled, 1–3-seeded. *Shrubs* or rarely perennial herbs, often evergreen and prickly, climbing by tendrils on the petioles; *flowers* greenish yellow.

1. *S. rotundifolia*, L. Stem shrubby, prickly, more or less 4-angled or sub-terete; leaves orbicular-ovate, acuminate, subcordate at base; common peduncles scarcely longer than the petioles.

ROUND-LEAVED SMILAX. Green-brier. Rough Bind-weed.

Plant glabrous, yellowish-green. *Stem* 20–30 (sometimes 50) feet long, slender, flexuose, somewhat branched, armed with straight rigid prickles, and climbing by tendrils.

Leaves 2-3 inches long, and often as wide as long; *petioles* one-third to three-fourths of an inch long, striate, margined at base, giving out a simple, filiform, but strong *tendrils* on each side, at the summit of the margin. *Flowers* greenish-yellow, in small globose axillary umbels. *Berries* dark blue, or bluish-black with a glaucous bloom, when mature.

Moist thickets and woodlands,—climbing bushes and trees: Canada to Carolina. *Fl.* June. *Fr.* October.

Obs. This rugged shrubby vine is often abundant in moist low grounds,—forming almost impenetrable thickets; and is a great annoyance to the woodman, when employed in clearing out such places. A form with the branches 4-angled; a smaller plant and seldom climbing is yet more difficult to subdue. It is quite frequent in sterile old fields, on our slaty hills,—and always indicates a low state of agriculture. There are several other prickly species in the United States—especially in the South; and some of them may be as annoying to the planter or farmer as these,—but I cannot speak of them from my own knowledge. We have an unarmed herbaceous species (*S. herba'cea*, L.)—frequent along fence-rows and borders of thickets—which is chiefly remarkable for the carrion-like feter of its flowers.

ORDER LXXVII. LILIA'CEÆ. (LILY FAMILY.)

Herbs with parallel-nerved, sessile or sheathing *leaves* and regular perfect *flowers*. Divisions of the *perianth* petal-like, similar, 6. *Stamens* 6; *anthers* introrse. *Styles* united; *stigmas* 3, sometimes united. *Fruit* a 3-valved loculicidal capsule, or sometimes a *berry*; *seeds* few or many; *embryo* in fleshy *albumen*.

A very large order, the different genera of which present a great variety of appearance. Besides the few we have mentioned below many are well known in cultivation, and are among the most brilliant ornaments of the garden, as the Hyacinth, Lily, Crown Imperial, Tulip, &c. The medicines Squill and Aloes are produced by plants of this order, as is the New Zealand Flax (*Phormium tenax*, Forst.), so valuable for the strength of its fibres.

Fruit a berry. *Herbs* from root-stocks, no bulbs. *Stem* branching. *Leaves* fine and thread-shaped.

1. ASPARAGUS.

Fruit a 3-celled pod, splitting into 3 valves when ripe. *Seeds* black.

* Roots fascicled, not bulbous.

Perianth united into a tube below; funnel-form.

2. HEMEROCALLIS.

** Scape simple from a coated bulb.

Flowers corymbed, white; *style* 3-sided.

3. ORINTHO GALUM.

Flowers racemed, blue or purple; *style* thread-like.

4. SCILLA.

Flowers in an umbel, from a scaly bract or involucre.

5. ALLIUM.

Fruit a 3-celled many-seeded pod. *Seeds* pale. *Perianth* of 6 petal-like distinct divisions.

Anthers fixed by their middle, swinging free; *stems* from a scaly bulb, leafy to the top.

6. LILIUM.

1. ASPAR'AGUS, L. ASPARAGUS.

[The ancient Greek name.]

Perianth of 6 nearly equal linear-oblong divisions, slightly connected at base, spreading at apex. *Stamens* 6,—the lower half of the filaments adnate to the base of the sepals; *anthers* peltate. *Style* short; *stigmas* 3. *Berry* globose, 3-celled; *cells* 2-seeded. *Perennials* with much-branched *stems* from thick and matted *root-stocks*, very narrow *leaves* in clusters, and small, greenish-yellow *flowers*.

1. *A. OFFICINA'LIS*, L. Unarmed; stem herbaceous, erect, paniculately branched; leaves fasciculate, setaceous and flexible.

OFFICINAL ASPARAGUS. Asparagus, or (corruptly) "Sparrow Grass."

Fr. Asperge. Germ. Der Spargel. Span. Esparrago.

Root perennial, consisting of numerous coarse fleshy fasciculate fibres. Plant smooth, 3-6 feet high,—the *turions*, or young stems, at first simple, stout and fleshy, with leaves in the form of appressed scales—finally the stem is ramified into a large panicle. Leaves unequal, one-third of an inch to an inch or more in length, very narrow, linear, flat, abruptly acute, in fascicles of 3-10 or 12 (often 6), with a minute ovate acuminate scarious stipule at the base of each fascicle. Peduncles in pairs (sometimes solitary), lateral (not axillary) at the base of the alternate branches, about half an inch long, slender, the upper half (above the thickened ring, or articulation) slightly clavate. Calyx pale greenish-yellow. Berries globose, slightly umbilicate, red when mature.

Gardens: cultivated. Native of Europe. Fl. May-July. Fr. September.

Obs. Almost every garden has a bed of Asparagus roots, for the sake of the young Turions—which afford a favorite vegetable dish in early spring. The plant has in some cases escaped from gardens and become naturalized, especially near the coast.

2. HEMEROCAL'LIS, L. DAY LILY.

[Greek, *Hemera*, a day, and *Kallos*, beauty; the flower lasting but a day.]

Perianth funnel form,—the short tube enclosing the ovary,—the 6-parted border spreading and lily-like, withering at the close of the day. Stamens 6, inserted at the throat; filaments and style long and thread-like, declined and ascending. Capsule 3-angled, rather fleshy, 3-valved; seeds several, subglobose, black. Smooth, showy perennials with fleshy-fibrous roots and long linear-keeled leaves, 2-ranked at the base of the tall scapes which bear at the summit several large showy bracted flowers.

1. *H. ful'va*, L. Perianth copper-colored or orange-tawny, the inner lobes obtuse and wavy on the margin.

TAWNY HEMEROCALLIS. Day Lily.

Leaves about 2 feet long and an inch wide, acute. Scape 3-4 feet high, corymbosely branched at summit, the branches bracteate at base. Perianth about 4 inches long,—the tube contracted, about an inch in length.

Gardens and about houses. Native of China. July.

Obs. This has strayed from gardens, where it is often cultivated and is naturalized in many places. It is very difficult to eradicate when once established. The *H. FLAVA*, L., a yellow-flowered species of smaller growth, is often seen in gardens.

3. ORNITHOG'ALUM, Tournef. STAR OF BETHLEHEM.

[Greek, *Ornis*, *ornithos*, a bird, and *gala*, milk; an ancient whimsical name.]

Perianth white, (or partly colored,) corolla-like, of 6 sepals slightly connected at base, spreading above the middle, 3-7-nerved. Stamens 6, the filaments dilated at base, narrowed and subulate at apex. Style 3-sided;

stigma 3-angled. *Capsule* membranaceous, roundish, obtusely trigonous, 3-celled. *Seeds* few in a cell, subglobose or angular; *testa* black, rugose. Scape and linear-channelled leaves from a coated bulb. Flowers corymbose, or racemose, bracted.

1. *O. umbellatum*, L. Racemes corymbose; peduncles longer than the bracts; perianth lobes white within, green outside, with white margins.

UMBELLATE ORNITHOGALUM. Ten o'clock. Star of Bethlehem.

Fr. Dame d'onze heures. Germ. Die Vogelmilch. Span. Ornitogalo.

Bulbs biennial? small, white. *Leaves* radical, numerous, 6-12 inches long, very smooth, green with a whitish longitudinal line. *Scapes* 6-9 inches high, terete, smooth, corymbosely branched at summit,—the branches or *peduncles* alternate, 1-2 inches long, each with a membranaceous linear-lanceolate acuminate bract at base. *Sepals* white within, externally green with a white margin. *Ovary* somewhat trigonous-turbinate, often abortive.

Pastures and cultivated fields: introduced. Native of the old world. Fl. May-June. Fr. July.

Obs. This foreigner has escaped from the gardens, in many places,—and multiplies its bulbs so rapidly as to become a great nuisance, if neglected. The bulbs are exceedingly tenacious of life; and when once completely in possession of the soil, it is an almost hopeless task to attempt to extirpate them. The leaves generally die, however, in the early part of summer,—and, in good land, are replaced by the valuable grasses; so that this obnoxious little intruder is not quite so serious a pest as some others;—such, for example, as the Canada Thistle, or Ox-eye Daisy.

4. SCILLA, L. SQUILL.

[The ancient name.]

Perianth of 6 colored (blue or purple) spreading divisions, mostly deciduous, with 6 awl-shaped *filaments* at their base. *Style* thread-like. *Pod* 3-angled, 3-valved, with several black, roundish seeds in each cell.—*Scape* and linear-leaves from a coated bulb; the usually bracted *flowers* in a simple raceme.

1. *S. Fraseri*, Gray. Leaves long, linear, keeled; bracts solitary, longer than the pedicels; stigma minutely 3-cleft.

FRASER'S SCILLA. Eastern Quamash. Wild Hyacinth.

Bulb onion-like. *Scape* about a foot high, bearing a long raceme of pale blue flowers. *Sepals* widely spreading, half an inch long, 3-nerved. Prairies and banks of rivers: Ohio and westward.

Obs. This is the celebrated Quamash, or Camass, which serves as food for some of the Indian tribes of the far west; the bulb is roasted, and is said to be sweet-tasted and agreeable.



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5. AL'LIIUM, L. GARLIC. ONION.

[The ancient Latin name of Garlic.]

Perianth of 6 entirely colored sepals, distinct or united at the base, 1-nerved, becoming dry, more or less persistent. *Filaments* subulate-filiform, more or less dilated below,—the inner or alternate ones often membranaceously dilated, trifid or with a slender cusp or tooth at summit, on each side. *Style* filiform; *stigma* simple or sometimes trifid. *Capsule* membranaceous, trigonous, or somewhat 3-lobed. *Seeds* few, roundish and angular; *testa* black, rugose or minutely granular-dotted. *Herbs*

FIG. 244. The Ten O'clock, or Star of Bethlehem (*Ornithogalum umbellatum*).

of a strong odor, with tunicated (biennial?) bulbs. *Scapes* naked, or with sheathing-leaves below, solid or fistular. *Leaves* mostly narrow, channelled, semi-cylindric, or terete, often hollow, sometimes flat. *Umbel* terminal, embraced by a membranaceous 1 – 2-valved marcescent spathe-like involucre. *Flowers* sometimes changed into *bulblets*.

* *Umbel* often densely bulb bearing, with or without flowers.

† *Leaves* flat.

1. *A. SATI'VUM*, *L.* Scape terete, leafy to the middle; leaves lance-linear, somewhat channelled; spathe 1-valved, with a long acumination, caducous.

CULTIVATED ALLIUM. Garden or English Garlic.

Fr. L'Ail. *Germ.* Der Lauch. Knoblauch. *Span.* Ajo.

Growing in bunches. *Radical bulbs* compound, consisting of small bulbous offsets, called *cloves*. *Scape* 1–2 feet high, smooth—the lower half apparently leafy, by the extension of the sheaths. *Leaves* 9–15 inches long, distichously arranged. *Heads* or umbels bearing numerous small ovoid-oblong bulbs, each bulb with a membranous covering. *Calyx* pale purple.

Gardens: cultivated. Native of Europe. *Fl.* July. *Fr.* September.

Obs. Cultivated as an article of medicine and used by some to season food, for which purpose it is extensively used in the Spanish American parts of our continent.

† † *Leaves* terete and hollow.

2. *A. vinea'le*, *L.* Scape terete, slender, sparingly leafy to the middle; leaves terete, with a narrow channel on the upper side; spathe abruptly acuminate.

VINE (OR VINEYARD) ALLIUM. Garlic. Field Garlic. Crow Garlic.

Fr. Ail des Vignes. *Germ.* Acker-Lauch. Wein-bergs-Lauch.

Bulbs small. *Scape* 2–3 feet high, very slender, with a few leaves below the middle. *Leaves* 8–12 or 15 inches long. *Umbel* globose, about an inch in diameter (smaller and densely capitate when bearing bulbs—the bulbs often vegetating while in the heads); *pedicels* of the flowers filiform, clavate. *Calyx* deep purple, tinged with green.

Pastures and cultivated grounds: introduced. Native of Europe. *Fl.* June. *Fr.* Aug.

Obs. Tradition says, this species was introduced by the first Welsh immigrants to Pennsylvania, for the purpose of supplying an early pasture. It is now completely naturalized, and was formerly so abundant in some districts, as to be quite a nuisance. It not only imparted a disgusting flavor to milk, butter, &c., but, by its abundance among the wheat, seriously injured the flour,—and rendered the manufacture of it difficult. Our best farmers, however, have now nearly subdued it, by the improvement of their land, and a judicious rotation of crops. A native species, the Meadow Garlic (*A. Canaden'se*, *Kalm.*), is frequent in moist meadows; it has flat leaves borne at the base of the scape.

3. *A. CE'PA*, *L.* Scape leafy at base only, fistular, and ventricose below

the middle, much longer than the leaves; leaves subterete, fistular, somewhat ventricose; umbel globose, usually capsule-bearing; spathe 1- or finally 2-valved, with a short acumination.

Onion. Garden Onion.

Fr. Oignon. *Germ.* Die Zwiebel. *Span.* Cebolla.

Bulb depressed or turnip-shaped, large (2-3 inches in horizontal diameter). *Scape* 2-3 feet high, terete, often an inch or more in diameter in the most ventricose portion, smooth, glaucous. *Leaves* 6 inches to a foot or more in length. *Umbel* 2-3 inches in diameter—the *pedicels* filiform. *Spathe* greenish-white. *Sepals* lance-oblong, white with a green keel. *Outer stamens* about as long as the calyx, spreading—the inner ones nearly twice as long, erect; *filaments* white, the 3 inner ones much dilated at base, obscurely toothed.

Gardens and fields: cultivated. Native country unknown. *Fl.* July. *Fr.* September.

Obs. This species—universally known and cultivated, as a culinary vegetable—is by far the most valuable of the genus. The culture is carried to a great extent in some favorable localities,—as at Wethersfield, Connecticut. There is a variety with bulb-bearing umbels, or heads, sometimes to be seen in gardens. The expressed juice of the Onion is a popular remedy for the croup, in children. Its stimulating quality is thus playfully alluded to, by SHAKESPEARE, in the Taming of the Shrew:

“ And if the boy have not a woman's gift,
To rain a shower of commanded tears,
An *Onion* will do well for such a shift;
Which in a napkin being close conveyed,
Shall in despite enforce a watery eye.”

* * *Umbel bearing only flowers and capsules.*

† *Leaves flat.*

4. *A. POR' RUM*, L. *Scape* rising from the centre of a simple bulb, terete, leafy to the middle; leaves broad, somewhat channelled or folded, and keeled, acute; umbel globose; sepals with a rough keel; stamens a little exserted.

LEEK ALLIUM. Leek. Garden Leek.

Fr. Porreau. *Germ.* Gemeiner Lauch. *Span.* Puërro.

Bulb middle-sized. *Scape* 2-3 feet high, stout and solid. *Leaves* distichously arranged on the lower half of the scape, 6-12 inches long, and about an inch wide at base, with the margin sometimes ciliate. *Spathe* with a long acumination. *Umbel* globose, dense, rather large (2 inches or more in diameter): *pedicels* of the flowers clavate. *Calyx* pale violet-purple. *Filaments* white.

Gardens: cultivated. Native of Europe. *Fl.* July. *Fr.* September.

Obs. This species—which is regarded as a sort of national emblem by the Welsh, is thus noticed by the poet, GAY:

“ *Leek to the Welsh*, to Dutchmen butter's dear,
Of Irish swains potato is the cheer;
Oats for their feasts the Scottish shepherds grind.”

Cultivated for use in soups.

† † *Leaves terete, hollow.*

5. *A. SCHÆNOPRASUM*, L. Scape naked or few-leaved at base, about as long as the subulate-filiform leaves; spathe 2-valved, about equal to the umbel.

RUSH-LEEK ALLIUM. Chives, or Cives.

Fr. Ciboulette. Germ. Der Schnittlauch. Span. Cebollino.

Growing in bunches. Bulbs small. Scape 6–9 inches high, smooth. Leaves erect, about as long as the scape. Umbel about an inch in diameter. Spathe of 2 ovate membranaceous nerved purplish valves. Calyx purple with a tinge of violet.

Gardens : cultivated. Native of Europe. Fl. July. Fr. September.

Obs. Cultivated as a culinary herb ; and often used as a kind of medicinal food for young poultry. Two or three other species of this genus are cultivated in Europe ; namely, *A. Scorodoprasum*, L., or *Rocambole* — *A. Scalonium*, L., or *Schallott*, &c. But I believe they are not much attended to, in this country. We have, also, a few native species ; but they are scarcely of sufficient importance to require the notice of the Agriculturist.

6. LIL' IUM, L. LILY.

[The classical Latin name.]

Perianth bell-shaped or funnel-form, of 6 distinct petal-like *sepals*, either clawed or sessile, often recurved or revolute, with a central groove inside near the base, deciduous. *Anthems* linear, versatile. *Style* longer than the *stamens*, somewhat clavate ; *stigma* 3-lobed. *Capsule* oblong, 3-angled, with the angles grooved ; *seeds* flat, margined, in 2 rows in each cell. *Bulbs* scaly ; *stems* simple, leafy ; *leaves* sessile, alternate, or whorled ; *flowers* very large.

1 *L. Canaden'se*, L. Leaves generally and remotely whorled, lanceolate, nerves and margins roughish-pubescent ; flowers nodding,—the lobes sessile, recurved.

CANADIAN LILIUM. Wild Yellow Lily.

Stem 2–3 feet high. *Leaves* 2–3 inches long, in rather distant whorls of 4–6. *Flowers* 3–7 or 10 (rarely solitary), all nodding, on *peduncles* 3–6 inches in length. *Perianth* yellow (sometimes reddish-orange), with numerous dark purple spots inside ; *lobes* 2–3 inches long, recurved from near the middle.

Common in meadows. June–July.

Obs. This, which is so very abundant and showy, is introduced as a representative of several native and cultivated species. Besides this, we have several other wild sorts, which will be found described in the floras ; the most conspicuous of them being the Turk's-cap Lily (*L. Superbum*, L.), which has sometimes as many as 20–40 flowers ; it is said to improve much by culture. The beautiful White Lily (*L. Album*, L.) is well known from being frequently cultivated in gardens, as is the Tiger Lily (*L. Bulbiferum*)—which produces little blackish bulblets in the axils of the leaves. The newly introduced Japan Lilies (*L. Lancifolium*,

and others), are perfectly hardy, and so beautiful that they should have a place in the smallest flower garden.

ORDER LXXVIII. JUNCA'CEÆ. (RUSH FAMILY.)

Herbs with jointed *stems*, grass-like or terete *leaves* and regular mostly perfect *flowers*. *Perianth* of 6 similar, dry and glumaceous, persistent *sepals*. *Stamens* 6 (rarely 3); *anthers* introrse. *Ovary* free, forming in fruit a 1-3-celled 3-valved many-seeded *capsule*. *Style* single. *Seeds* erect; *embryo* enclosed at the base of hard *albumen*.

An Order possessing but little beauty or value.

1. JUN'CUS, L. RUSH.

[Latin, *Jungere*, to join; being used to tie or bind objects together.]

Sepals 6, glumaceous. *Stamens* mostly 6, inserted on the base of the *sepals*,—sometimes those on the 3 inner *sepals* abortive. *Stigmas* 3, subsessile, filiform, villous. *Capsule* 3-celled, or somewhat 1-celled by the incompleteness of the dissepiments, 3-valved,—the valves bearing the dissepiments in the middle. *Seeds* numerous. Chiefly *perennials* with mostly simple and scape-like *pithy stems* and cymose, paniculate or clustered small greenish or brownish *flowers*.

1. J. effu'sus, L. Stem naked, often sterile, furnished with short leafless sheaths at base, filled with spongy pith; panicle produced from the side of the scape above the middle, diffusely much branched.

EFFUSED JUNCUS. Common Rush. Soft Rush.

Root perennial, forming tussocks. *Culms* 2-3 feet high, simple, soft and pliable, sheathed at base, and terminating at summit in a long tapering point. *Inflorescence* cymose-paniculate, bursting from a fissure in the side of the culm near the summit, often proliferous, bracteate; *bracts* oblong-lanceolate, scarious. *Stamens* 3, shorter than the *sepals*, opposite the 3 outer ones; *anthers* white. *Capsule* trigonous-obovoid, obtuse. *Seeds* minute, oblong, acute at each end, yellowish.

Moist meadows and low grounds: throughout the United States. *Fl.* June. *Fr.* July-August.

Obs. The genus is a numerous one,—comprising about 100 known species—of which some 18 or 20 are natives of the U. States. They are all homely plants, and entirely worthless to the farmer; but the one here given is the most troublesome,—continually forming numerous unsightly bunches or tussocks, in wet low grounds—and requiring some attention to keep it in proper subjection. Mr. ELLIOTT says that in S. Carolina, this Rush “occupies and almost covers rice-fields as soon as they are thrown out of cultivation.”

The “Black Grass” so common in salt marshes along the coast is **J. bulbosus, L.**, and the little species so common along footpaths, seeming to flourish best where it is most trodden on, is **J. bufonius, L.**

ORDER LXXIX. CYPERA'CEÆ. (SEDGE FAMILY.)

Rush-like or grass-like *herbs*, with fibrous roots and solid *stems* (*culms*), and closed sheaths. *Flowers* usually one in the axil of each of the glume-like bracts which form an imbricated cluster or spikelet. *Perianth* none, or consisting of scales or bristles. *Stamens*

mostly 3. *Ovary* 1-celled, with a single erect ovule, becoming in fruit an *akene*, which is lenticular when the style is 2-cleft, and triangular when it is 3-cleft. *Embryo* minute at the base of farinaceous *albumen*.

An Order of some 50 genera, remarkable for their worthlessness ; and also for their presence, or prevalence, at least, being an indication of swampy, neglected, or valueless land. The herbage of this Order, unlike that of a large number of the Gramineæ, or true Grasses, contains but little saccharine matter ; and therefore is neither nutritious nor palatable to stock.

An example is given of three of the genera, selecting such as are likely to attract the notice of the farmer. They are favorite plants with the Botanist, and those who have a curiosity to know more of them will find them described in the Floras.

Flowers perfect, 2-ranked : spikes few - many-flowered.

Perianth none.

Flowers perfect, scales imbricated in several ranks.

Perianth of 3 - 6 bristles. Achenium pointed with the continuous base of the style.

Flowers monœcious in the same or separate spikes (sometimes diœcious). Achenium enclosed in a sac, lenticular or triangular.

1. CYPERUS.

2. SCIRPUS.

3. CAREX.

1. CYPERUS, L. GALINGALE.

[An ancient Greek name,—of uncertain etymology.]

Spikelets many-flowered, or rarely few-flowered. *Scales* distichously imbricated,—the lowest ones empty and sometimes smaller. *Perianth* none of any kind. *Stamens* 2 or 3. *Styles* 3 (rarely 2.) united below into one, deciduous. *Akene* crustaceous, triquetrous or compressed. Perennial herbs. *Culms* simple, often triquetrous, leafy and sheathed at base. *Leaves* grass-like. *Spikelets* in loose spikes, involucrate fascicles, or umbels ; *peduncles* unequal, sheathed at base.

1. *C. strigosus*, L. Spikes compressed, linear awl-shaped, crowded at the summit of the rays of a large open umbel ; sheaths of the peduncles 2-bristled ; style trifid ; stamens 3 ; achenium linear-oblong.

STRIGOSE CYPERUS. Bristle-spiked Galingale.

Culm 1 - 2 or 3 feet high, triquetrous, smooth, leafy below and tuberous at base. *Leaves* rather broad, acute, keeled, nearly as long as the culm, somewhat scabrous on the margin. *Umbel* 3 - 6 or 9-rayed, rather spreading ; rays unequal, 1 or 2 - 4 or 5 inches long, triquetrous, sheathed at base, the central ones suppressed (*i. e.* the central spikes sessile). *Spikes* yellowish, about three-fourths of an inch long,—the scales somewhat loosely imbricated, striate, with a green keel and yellowish sides. *Styles* long, 3 united in one, distinct at summit. *Akene* triquetrous, oblong, acute, roughish-dotted.

Wet meadows and low grounds : throughout the United States. *Fl.* August. *Fr.* September.

Obs. This species is inserted—not as being a particularly troublesome weed, but—as one of the most conspicuous of the genus, in the swampy meadows of the middle and northern States. The two which follow belong rather to the Southern States,—and are there regarded as real scourges by the Planters.

2. *C. phymatodes*, Muhl. Root creeping, tuberiferous at the extremities ; umbel mostly simple, 4 - 6-rayed ; involucre about 3-leaved, much longer than the rays ; spikes linear, obtuse, sub-compressed, approximated, somewhat spreading, each 12 - 20-flowered.

“ Nut Grass,” of Florida.

Root (or rhizoma) creeping extensively, and sending up numerous suckers,—the fibrous branches often terminating in *tubers* the size of a pea. *Culm* 1 to near 2 feet high, triquetrous, very smooth. *Leaves* 9–18 inches long, and 2–3 lines wide, keeled, smooth or slightly scabrous on the margin, yellowish green. *Umbel* rather erect,—the *rays* 1–2 or 3 inches long. *Involucre* usually 3–4-leaved. *Spikes* half an inch to three-quarters in length, a little compressed, obtuse when mature, somewhat distichously arranged on the common rachis,—the lowest ones often in pairs or fasciculate; *scales* oblong, rather acute, nerved, pale tawny. *Styles* 3, united in one, distinct at summit. *Akene* triquetrous, oblong, minutely punctate.

Banks of streams, pastures, and cultivated grounds: New England, west and south.

Obs. This species is, fortunately, rather rare, in the Northern and Middle States; but it is said to be a troublesome plant, in the South.

3. *C. rotundus*, L., var. *Hydra*, Gray. Rhizoma creeping, tuberiferous; umbel mostly simple, 3–4-rayed; involucre 2–3-leaved, about as long as the rays; spikes distichous; spikelets 4–9 on each ray, lance-linear, acute, much compressed, 10–40-flowered, dark chestnut-purple.

HYDRA CYPERUS. “Nut-grass,” of S. Carolina. “Coco-grass.”?

Rhizoma creeping,—its branches ending in *tubers* nearly half an inch in diameter. *Culm* 3–8 and 12 inches high, triangular, smooth, naked. *Leaves* all radical, shorter than the culm, about 2 lines wide, acute, slightly channelled, often recurved, somewhat glaucous. *Involucre* sometimes shorter than the umbel. *Rays* of the umbel 2–3 inches long, erect or slightly spreading. *Spikes* nearly an inch long, alternate and distichous along the upper part of the rays,—the *scales* closely imbricated, bright chestnut-color with a green keel, not nerved, slightly mucronate. *Styles* 3, united below, distinct at summit. *Akene* triquetrous.

Sandy fields, sand drifts, along the Sea-coast: Virginia to Florida, and Arkansas. *Fl.* All summer.

Obs. This is stated to be one of the greatest pests of the Southern Planters. It seems to be an inhabitant of all the 4 quarters of the globe. Mr. ELLIOTT gives the following account of it:—“This grass (?) is becoming a great scourge to our planters. It shoots from the base of its stem a thread-like fibre, which descends perpendicularly 6 to 18 inches, and then produces a small tuber. From this, horizontal fibres extend in every direction, producing new tubers at intervals of 6 or 8 inches, and these immediately shoot up stems to the surface of the earth, and throw out lateral fibres to form a new progeny. This process is interminable,—and it is curious to see what a chain or net-work of plants and tubers can, with some care, be dug up in a loose soil. The only process, yet discovered, by which this grass can be extirpated, is to plough or hoe the spots in which it grows every day through the whole season. In their perpetual efforts to throw their leaves to the light, the roots become exhausted and perish,—or if a few appear the next spring, they can easily be dug up.” J. S. SKINNER, Esq., in a letter written during an excursion to the South, in the spring of 1846, sent to me an imperfect specimen of a Cyperaceous plant, which I suspect to be this species; and says of it,—“I send you inclosed a spear or shoot of the vilest of all pests, the Coco-grass,—which has taken possession of, and caused to be abandoned, some of the best Sugar estates in Louisiana. Of all things it is said to be the most tenacious of life; and nothing serves so well to propagate it, as to plough and replough, with a view to destroy it.”

There are numerous other species of *Cyperus*, in the U. States ; but the foregoing are the most important for the Agriculturist to be acquainted with. The Papyrus—which the ancients used, for writing upon, prior to the manufacture of paper from rags—was obtained from a species of this genus, viz : *C. Papyrus*, *L.*

2. SCIR'PUS, *L.* BULRUSH.

[An ancient Latin name for the *Bul-rush*,—which belongs to the genus.]

Spikelets many-flowered. *Scales* imbricated on all sides. *Perianth* of 3–6 capillary bristles. *Styles* 2–3-cleft. *Akene* crustaceous, either somewhat compressed, or trigonous—according to the condition or number of the styles or stigmas. *Culms* mostly simple, triangular or terete, often with leafless sheaths. *Spikes* either solitary, conglomerate or corymbose, terminal or lateral.

1. *S. pun'gens*, *Vahl.* Culm triquetrous, nearly leafless ; spikes ovoid-oblong (1–5), in a dense cluster long overtopped by the pointed involucral leaf ; scales orbicular-ovate, emarginate, mucronate ; bristles 2–6, slender, shorter than the akene ; styles 2, united below, free at summit ; akene subcompressed, obscurely trigonous, abruptly acuminate.

SHARP-POINTED SCIRPUS. Chair-maker's Rush.

Root (or *rhizoma*) creeping. *Culm* 2–4 or 5 feet high, cuspidate at summit, acutely triquetrous, naked and smooth, sheathed at base,—the sheaths often bearing a few short triangular-carinate leaves. *Spikes* nearly sessile, in a dense lateral cluster,—i. e. at the base of an erect tapering 1-leaved involucre, which is apparently a continuation of the culm. *Scales* often emarginate, and mucronate with the projecting midrib, ferruginous on the sides, the margins scarious and pubescent-ciliate. *Bristles* retrorsely scabrous, brittle. *Akene* smooth, dark-brown.

Swampy meadows and muddy margins of rivers—salt and fresh : throughout the United States. *Fl.* July. *Fr.* Sept.

Obs. This is the plant used in making the seats of “ Rush-bottomed Chairs,” in the U. States. Some of the English Botanists say, the terete culms of the *S. lacustris*, *L.*, or common Bulrush, are used for that purpose,—which I think must be a mistake ; as they are certainly much inferior, in tenacity and pliability, to those of this species,—and the chair-makers would be apt to discover the fact. Numerous species of this genus occur in our wet low grounds ; but, although of no value in Agriculture, they scarcely require notice, here,—inasmuch as they are neither very troublesome, nor difficult to get rid of, by draining, and other appropriate management of the grounds.

3. CA'REX, *L.* SEDGE.

[A classical name,—of obscure etymology.]

Staminate and *pistillate* flowers either in *distinct* spikes on the same plant (*monœcious*) or in *different* portions of the same spike, (*androgynous*), rarely on distinct plants (*diœcious*). *Scales* 1-flowered, imbricated on all sides. *Stamens* mostly 3. *Ovary* included in a membranous (often

beaked and inflated) *sac* or *perigynium*. *Akene* lenticular or triquetrous (according as the stigmas are 2 or 3), more or less beaked with the base of the style. *Perennial herbs* with usually *cæspitose culms* which are triangular, often nodose and leafy. *Spikes* terminal and axillary, mostly *bracted* at base.

Obs. The three species here described, are inserted merely as samples of a very extensive genus of unprofitable plants,—of which every intelligent farmer would like to know something. Those who may desire to become better acquainted with the family, will find the species well described, in various Monographs and Floras.

* SPIKES ALL ANDROGYNOUS.

† *Spikes clustered, staminate at their summit. Stigmas 2.*

1. *C. vulpinoi'dea*, *Muhl.* Spike oblong, decompound, interrupted, bracteate,—of 8–10 crowded clusters; fruit compressed, ovate, acuminate, 3-nerved, scabrous on the margin, finally diverging, rather shorter than the ovate cuspidate scale.

VULPINA-LIKE CAREX. Sedge. Sedge-grass.

Culm about 2 feet high, obtusely triangular and leafy at base, acutely triquetrous above. *Leaves* lance-linear, channelled above, scabrous on the margin,—the upper ones overtopping the culm; *sheaths* transversely rugose on the side opposite the leaves. *Spike* 2–3 inches long, formed of numerous spikelets which are crowded into clusters a little separated from each other, and either appressed to the rachis or diverging. *Bracts* at the base of the compound spike, and also of the principal clusters, often long and foliaceous,—those at the base of the spikelets, short, setaceous and scabrous. *Staminate glumes* lanceolate, with a short point. *Pistillate glumes* ovate, with a long serrulate point. *Fruit* 3-nerved, bifid at apex, rather small, densely crowded, finally much diverging, and yellowish.

Swamps and low grounds: Northern and Middle States. *Fl.* May. *Fr.* July.

Obs. This, like all the other species of this very numerous genus (amounting to some 300 or more), is a very worthless plant; and is often quite abundant in wet meadows. The form of the akenes, in *Carex*—like those of *Polygonum*, already noticed—has a constant relation to the number of styles or stigmas. When the stigmas (or stigmatose branches) are 2, the akene is compressed, and ancipital or 2-edged; but when there are 3 stigmas, the akene is uniformly triquetrous. A similar relation, between the form of the akene or nut, and the number of the styles or stigmas, appears to exist in numerous other instances,—as in *Rumex*, *Rheum*, *Scirpus*, *Cyperus*, *Fagus*, *Morus*, *Alnus*, *Betula*, &c., &c., and the law may, perhaps, be general.

** STAMINATE AND PISTILLATE SPIKES, DISTINCT.

† *Staminate spike solitary: pistillate subsessile. Stigmas 3.*

2. *C. tentacula'ta*, *Muhl.* Staminate spike bracteate, on a short peduncle; pistillate spikes about 3, cylindric-oblong, approximate, horizontal, the uppermost sessile, the lower on short exserted stalks; bracts

long, foliaceous; fruit densely crowded, ovoid, ventricose, nerved, long-beaked, about twice as long as the lance-linear awned scale; the beak with short, minutely serrulate teeth.

TENTACULATE OR MANY-BEAKED CAREX.

Whole plant yellowish-green. *Culm* 12–18 inches high, triquetrous, scabrous on the angles above, leafy. *Leaves* linear-lanceolate, nerved, scabrous on the margin, longer than the culm. *Staminate spike* about an inch long, with a narrow lance-linear *bract* at base longer than the spike; *glumes* lance-linear, terminated by a long scabrous awn. *Pistillate spikes* commonly 2–3 (often but 1—rarely 4), about an inch or an inch and a half long,—the upper ones approximate, sessile—the lowest one a little distant on a short scarcely exerted peduncle; *glumes* terminated by a long setaceous scabrous awn. *Bracts* resembling the leaves, very long. *Fruit* ovoid, inflated, spreading, smooth and shining, attenuated into a long straight slender beak. *Akene* triquetrous, roughish punctulate.

Swampy low grounds. *Fl.* May–June. *Fr.* August.

Obs. This is a very common species, in the swampy meadows of Pennsylvania,—and probably throughout the greater portion of the United States.

†† *Staminate spikes mostly 2 or more. Stigmas 2.*

3. *C. stricta*, Lam. *Staminate spikes* 1–3; *pistillate spikes* usually 2 or 3, rather distant, cylindric, subsessile, often staminate at summit; fruit compressed, ovate, with a very short beak and the orifice entire, about as long as the oblong-lanceolate awnless scale.

UPRIGHT CAREX. Tussock-sedge.

Culms 1–2 feet high, very slender and acutely triquetrous, striate, minutely serrulate on the angles, leafy at base,—usually growing in large dense tufts, or *tussocks*. *Leaves* narrow, linear, keeled, scabrous on the margin, often longer than the culm,—the radical ones very numerous and loosely spreading, forming a large tuft of a lively bluish-green. *Staminate spikes* 2–3 (often solitary), erect, sessile except the uppermost one; *glumes* oblong, mostly obtuse. *Pistillate spikes* 3 (or often but 2), 1–2 inches long, rather slender,—the lowest one on a very short peduncle—the upper one sessile, and often staminate at summit (*androgynous*); *glumes* brown, with a green keel. *Fruit* ovate, elliptic, or obovate, smooth. *Akenes* obovate, mucronate, punctulate.

Swamps: throughout the United States. *Fl.* April. *Fr.* June.

Obs. It is the most common, and most troublesome, of all the species. It is true, that a pedestrian, in crossing neglected boggy meadows, finds its dense tufts quite a convenience, to step on,—yet it is decidedly more farmer-like to provide good walking, in such places, by ditching and draining. The tussocks, formed by the matted fibrous roots, of this species of *Carex*, are often very large, and very durable. I once hauled a quantity of them into the barn-yard, with a hope that they might decompose, and make manure; but they effectually resisted decomposition, and were tossed about the yard for years,—as large, and almost as indestructible, as so many hatters' blocks. The best way to dispose of them, is to collect them—when cut out and dried—into a heap, and burn them,—taking care afterwards, by appropriate draining, to prevent the growth of others.



FIG. 245. The Many-beaked Carex (*Carex tentaculata*). 246. A fruit with its bract. 247. The akene removed from the perigynium.

GRAMINÆÆ. (GRASS FAMILY.)

TRUE GRASSES, with mostly hollow stems (*culms*) which are cylindrical and jointed, closed at the joints (*nodes*); leaves alternate, 2-ranked, parallel-nerved, the dilated *petiole* (*sheath*) surrounding the culm and split open on the side opposite to the blade, and furnished at the junction with the blade with a more or less manifest scarious appendage (*ligule*). Flowers perfect, polygamous or monœcious (rarely diœcious), imbricated with 2-ranked *glumes* or *bracts*, the outer pair (*glumes*), subtending a *spikelet* of one or several flowers, the inner pair (*paleæ*) enclosing each particular flower which is destitute of a proper perianth. *Stamens* 1-6, usually 3; *anthers* versatile. *Ovary* 1-celled, 1-ovuled, usually with 2-3 scales (*squamulæ*) at base. *Styles* mostly 2 or 2-parted; *stigmas* plumose or hairy. *Fruit* a seed-like grain (*caryopsis*); *embryo* small at the base and on the outside of copious farinaceous *albumen*. *Annuals* or *perennials*, with *fibrous roots*, often *cæspitose*. *Spikelets* paniculate or spiked, upper (inner) *palea* 2-nerved or 2-keeled.

This vast Order—comprising some 230 genera, and perhaps not less than 3000 species—is probably the most generally diffused, and the most important to man, of all the families of plants. The seeds, and herbage, furnish a principal portion of the food of the human race, and of the more valuable domestic animals. A great number of the Grasses, however, are little better than weeds, on a farm,—and some of them exceedingly annoying. Those which the American Agriculturist is more immediately interested to know, are here inserted.

1. THE POA SUB-FAMILY.

Spikelets 1-many-flowered; when more than one-flowered, the lowest developing first, the *uppermost* if any, imperfect or abortive, the rest perfect, or occasionally monœcious or diœcious—except in Nos. 16 and 23, where the lowest florets are *sterile*.

§ 1. *Spikelets* 1-flowered, in panicles, the flowers often monœcious. *Glumes* very small or wanting. Inner *palea* 3-nerved. *Stamens* 1-6.

Flowers perfect.

Glumes wanting. Flowers flattened. *Paleæ* awnless.

1. LEERSIA.

Glumes 2, small, cuspidate. *Stamens* 6.

2. ORYZA.

Flowers monœcious.

Fertile flowers awned.

3. ZIZANIA.

§ 2. *Spikelets* 1-flowered, perfect, sometimes with the abortive rudiment or pedicel of a second flower above, panicle, the panicle sometimes contracted into a dense spike or head. *Stamens* not more than three.

Flowers in a dense cylindrical spike. *Glumes* equal, strongly flattened, and with the *paleæ* herbaceous.

Glumes united at base. Lower *palea* awned, the upper wanting.

4. ALOPECURUS.

Glumes distinct at base. *Paleæ* 2, the lower truncate and awnless.

5. PHLEUM.

Flowers mostly loosely panicle, not strictly spiked, usually small. *Glumes* equal or unequal, membranaceous. Flower raised on a more or less evident stalk (*callus*) in the *glumes*.

Flower naked or barely hairy at base.

Glumes equal or the lower one rather longer, pointless, exceeding the very thin, blunt *paleæ*. Lower *palea* pointless, commonly awned on the back; the upper sometimes wanting.

6. AGROSTIS.

Lower glume mostly smaller. *Paleæ* often hairy at base, the lower one mucronate or awned at the tip.

7. MUHLBERGIA.

Flower hairy-tufted at base.

Lower *palea* mostly awned on the back, not bristle-pointed, shorter than the *glumes*.

8. CALAMAGROSTIS.

§ 3. *Spikelets* (rarely 1-flowered) usually 2-several-flowered, with one or more of the upper flowers imperfect, disposed in one-sided racemose or digitate spikes. *Glumes* persistent, the upper one looking outward. *Rachis* not jointed. *Stamens* 2-3.

Spikelets with one perfect flower below and one or more neutral ones above. Flower and rudiment awnless. Spikes slender, digitate.

9. CYRUS.

- Spikelets with more than one of the lower flowers perfect.
 Spikes digitate at the summit of the culm, dense. Glumes and paleæ both awnless and blunt.
- § 4. Spikelets several- (few to many-) flowered, often with the uppermost (rarely the lowest) floret imperfect or abortive,—usually disposed in open panicles. Paleæ pointless or the lower one sometimes tipped with a straight awn or bristle. Stamens 1–3.
- * Culms herbaceous. Lower flowers of the spikelets all perfect.
 Grain free from the paleæ and smooth.
 Glumes (rather long) and the lower palea awn-pointed, herbaceous, compressed-keeled. Panicle contracted in one-sided clusters.
10. ELEUSINE.
- Lower palea awnless and pointless.
 Lower palea rounded on the back, 5–7-nerved, scarious at the tip. Spikelets many-flowered, the rachis commonly breaking up into joints at maturity.
11. DACTYLES.
- Lower palea laterally compressed, mostly keeled, membranaceous, 5-nerved, the margins or nerves below often cobwebby-pubescent. Spikelets flattened.
12. GLYCERIA.
- Lower palea convex on the back, acute, sub-coriaceous, 3–5-nerved, not cobwebby at base.
13. POA.
14. FESTUCA.
- Grain adherent to the upper palea and hairy at the apex.
 Lower palea convex or keeled on the back, mostly awned below the 2-cleft tip, 5–9 nerved.
15. BROMUS.
- ** Culms herbaceous, often tall and reed-like. Lowest flower sterile.
 Spikelets strongly silky-bearded on the rachis, loosely flowered.
16. PHRAGMITES.
- *** Culms woody, suffruticose or arborescent.
 Spikelets flattened, loosely 5–14-flowered.
17. ARUNDINARIA.
- § 5. Spikelets 1–several-flowered, sessile on opposite sides of a zigzag jointed rachis (which is toothed or excavated on one side of each joint), forming a spike. Glumes sometimes abortive or wanting. Otherwise as in § 4.
- Spikelets single at each joint of the rachis ; several-flowered.
 Glume 1, external. Spikelets placed edgewise on the rachis.
18. LOLIUM.
- Glumes 2, transverse (right and left) ; spikelets placed flat-wise on the rachis.
 Spikelets 3–several-flowered.
19. TRITICUM.
- Spikelets 2-flowered.
20. SECALE.
- Spikelets 2–4 at each joint of the rachis.
 Spikelets 1-flowered, 3 at each joint, the 2 lateral ones usually sterile.
21. HORDEUM.
- § 6. Spikelets 2–several-flowered, panicle ; the rachis or base of the flowers often villous-bearded. Glumes mostly equalling or exceeding the flowers. Lower palea mostly bearing a twisted, bent or straight awn on its back below its apex. Stamens 3.
- Flowers all perfect, or the uppermost merely rudimentary.
 Lower palea cleft at the apex into 2 acute teeth.
 Awn proceeding from the mid-nerve only, below the apex, mostly twisted or bent. Lower palea rounded on the back.
22. AVENA.
- One of the flowers staminate only.
 Lower flower staminate ; the perfect one commonly awnless ; the uppermost a rudiment. Otherwise as in 22.
23. ABRHENATHERUM.
- Lower flower perfect and awnless ; the upper staminate and awned. Rudiment none.
24. HOLCUS.

2. THE PHALARIS SUB-TRIBE.

Spikelets more or less panicle, 3-flowered, the uppermost or middle flower perfect ; those (apparently) on each side imperfect, staminate, neutral or reduced to an inconspicuous rudiment.

Lateral flowers neutral, each of a single awned palea, the perfect flower awnless with 2 stamens.

Lateral flowers reduced to a small rudiment on each side of the coriaceous, shining, flattened fertile one

25. ANTHOXANTHUM.

26. PHALARIS.

3. THE PANICUM SUB-TRIBE.

Spikelets 2 flowered, but the lower floret always imperfect, either staminate or neutral; in the latter case reduced to a single empty palea (placed next to the lower glume if that be present); the upper (terminal) flower (placed next the upper glume) only fertile. Flowers polygamous or monœcious, sometimes apparently simple and 1-flowered from the abortion of the lower glume and the upper palea of the neutral flower. Rarely both glumes are absent.

§ 1. Paleæ of the fertile florets coriaceous or chartaceous, awnless, not keeled, embracing the smooth grain, flattened parallel with the herbaceous glumes.

Spikelets appearing as if 1-flowered from the suppression of the lower glume; the single empty palea of the neutral flower occupying its place. Spikelets jointed with their short pedicels.

27. PASPALUM.

Spikelets manifestly $1\frac{1}{2}$ - 2-flowered (the lower floret neutral or staminate), the lower glume being present.

Spikelets not involucrate nor the peduncles bristle-bearing. Lower glume small or minute. Sterile flower staminate or neutral.

28. PANICUM.

Spikelets spiked-panicled, the peduncles continued beyond the flower into a bristle. Otherwise as in 28.

29. SETARIA.

Spikelets enclosed, 1-5 together in a hard and spiny bur-like involucre.

30. CENCHRUS.

§ 2. Paleæ membranaceous or scarious, always of thinner and more delicate texture than the (often indurated) glumes,—frequently awned at the apex. Spikelets usually in pairs or threes, panicled or spiked; monœcious or polygamous.

Spikelets monœcious; the pistillate ones imbedded in the rachis of the continuous spike or in its separable joints. The staminate spikelets above.

Pistillate spikelets imbedded in the joints of the spontaneously separable naked rachis.

31. TRIPSACUM.

Pistillate spikelets along the sides of a continuous rachis, which is enclosed by the sheaths of abortive leaves or husks.

32. ZEA

Spikelets polygamous. Fertile spikelets with one perfect and one sterile (staminate or mostly neutral) floret. Lower palea of the perfect flower awned.

Spikelets in pairs at each joint of the rachis, one pedicellate the other sessile.

The upper floret in each spikelet fertile.

33. SACCHARUM.

The sessile spikelet only fertile.

34. ANDROPOGON.

Spikelets 2-3 together, in loose open panicles, the lateral ones sterile, or often mere rudiments.

35. SORGHUM



The above cuts represent in detail three different forms of the inflorescence of grasses. FIG. 248. A spikelet of a one-flowered grass. *a* The lower, and *b* the upper glume. *c* The lower palea. *d* The upper palea having two nerves. *e* The stamens and pistil, the latter with two plumose stigmas, and two scales at its base. FIG. 249. Spikelet of a three-flowered grass (*Anthoxanthum*) with one flower only fertile. The parts separated and placed in their relative position below. *a* and *b* The lower and upper glumes. *c* and *d* The imperfect florets, each of a single awned palea. *e* Lower palea of the perfect flower. *f* Upper palea of the same. *g* The two stamens. *h* The pistil. FIG. 249'. A spikelet of a several-flowered grass. *a* and *b* Lower and upper glumes. *c* *d* and *e* The flowers placed on alternate sides of a short stem or rachis. *f* A terminal abortive floret.

1. LEER'SIA, Solander. FALSE RICE.

[Named in honor of John Daniel Leers; a German Botanist.]

Spikelets 1-flowered, perfect, disposed in one-sided racemose *panicles*, articulated with the short *pedicels*. *Glumes* wanting. *Paleæ* chartaceous, compressed carinate, awnless, bristly-ciliate on the keels, nearly equal in length, but the lower one much broader and boat-shaped, enclosing the flat grain. *Stamens* 1-6. *Stigmas* plumose with branching hairs. *Perennial* marsh grasses, with the *culms*, *sheaths* and flat *leaves* retrorsely scabrous.

1. *L. oryzoïdes*, Swartz. Panicle diffusely branched; florets triandrous; paleæ conspicuously ciliate on the keel.

ORYZA OR RICE-LIKE LEERSIA. Cut-grass. False or wild Rice.

Root perennial, creeping. *Culm* 3-5 feet high, striate, scabrous with minute retrorse prickles, the *nodes* pubescent. *Leaves* 6-12 inches long, lance-linear, acuminate, keeled, retrorsely and sharply scabrous, ciliate on the margin; *sheaths* sulcate striate, very rough with retrorse prickles in the grooves; *ligule* short, retuse. *Panicle* usually sheathed at base, much branched; *branches* flexuose, the lower ones in threes and fours. *Spikelets* elliptic-oblong, pedicellate, greenish-white. *Paleæ* compressed, pectinate-ciliate on the keel, the lower one boat-shaped, 3-nerved, the upper one a little longer, linear, 1-nerved.

Swamps, and along sluggish rivulets: throughout the United States. *Fl.* August. *Fr.* Sept.

Obs. This rough grass seems to be common to both hemispheres,—and is often quite abundant in our swampy meadows, and along the margins of muddy streams. Although this grass is said to have some value at the South, it is in the Northern States considered not only worthless, but rather a nuisance. The farmer should therefore know it, and take measures (by drainage, &c.) to expel it, or keep it in subjection.

2. ORY'ZA, L. RICE.

[The Greek name of Rice,—coined from *Eruz*, its Arabic name.]

Spikelets 1-flowered, perfect. *Glumes* 2, small, awnless but cuspidate, slightly concave. *Paleæ* 2, compressed-carinate, nearly equal in length,—the lower one broader, and often with a straight awn at apex. *Stamens* 6. *Ovary* smooth; *stigmas* plumose,—the hairs branched. *Caryopsis* oblong, free, closely embraced by the persistent paleæ.

1. *O. SATI'VA*, L. Leaves lance-linear, elongated, rough; panicle racemose, contracted; branches slender, rough; paleæ oblong, scabrous, awnless or often with a terminal awn.

CULTIVATED ORYZA. Rice. Common Rice.

Fr. Le Riz. *Germ.* Der Reiss. *Span.* Arroz.

Root annual. *Culm* 2-4 or 5 feet high, smooth, striate. *Leaves* 9-18 inches long broadish, rough on the upper surface, smooth beneath; *sheaths* striate-nerved, smooth; *ligule* elongated (half an inch to three-quarters in length), erect, tapering to a point. *Panicle* oblong, 4-8 or 9 inches in length, with the branches erect. *Outer palea* nerved or ribbed, hispidly scabrous, often awned, the inner one awnless.

Cultivated in the Southern States. Native of Asia? *Fl.* *Fr.*

Obs. There are several varieties of cultivated Rice ; some, called Upland or Mountain Rice, usually awnless,—others, with the paleæ commonly awned, or mucronate, cultivated in low grounds which can be irrigated, or overflowed with water. The aquatic variety is one of the staple crops of South Carolina. The importance of this plant, to the inhabitants of the tropical regions, generally—but especially in Asia—can scarcely be estimated by the residents of higher latitudes. It is believed that its seeds enter more largely into the nourishment of the human family than those of any other plant—not excepting even Wheat.

3. ZIZA'NIA, Gronov. INDIAN RICE.

[A Greek name of some plant now doubtful.]

Flowers monœcious ; the *staminate* and *pistillate* ones in the same panicle, both 1-flowered. *Glumes* wanting, or in the pistillate spikelets rudimentary and cup-shaped. *Paleæ* herbaceo-membranaceous, convex, awnless in the staminate spikelets, but tipped with a straight awn in the pistillate ones. *Stamens* 6. *Stigmas* pencil-form. Stout aquatic grasses ; spikelets readily separating at maturity from the club-shaped pedicels with which they are articulated.

1. Z. AQUAT'ICA, L. Panicle pyramidal,—the lower branches spreading, bearing staminate flowers—the upper branches erect, bearing pistillate flowers ; spikelets on clavate pedicels ; awns long ; caryopsis slender, elongated.

AQUATIC ZIZANIA. Water Oats. Reed. Indian Rice.

Root perennial. *Culm* 4–8 or 10 feet high, stout, fistular, terete, glabrous. *Leaves* 1–2 or 3 feet long, and an inch to an inch and a half wide, linear-lanceolate, keeled, smooth, serrulate on the margin ; *sheaths* striate, smooth, the base, at the nodes, surrounded with a ring of short silky appressed pubescence ; *ligule* rather large, elongated, erect, lanceolate, finally lacerate-dentate, often purplish. *Panicle* 1–2 feet long, the branches verticillate. *Pistillate spikelets* about an inch long, needle-like, somewhat racemose on the branches. *Paleæ* scabrous, dark greenish-purple, the lower one closely embracing the upper one, and terminating in a slender straight hispid awn as long as the spikelet.

Muddy margins of tide waters, swampy rivulets, &c. : throughout the United States. *Fl.* Aug. *Fr.* Sept. – Oct.

Obs. This fine stout Grass is well known, along the muddy shores of our tide waters, as the favorite resort of the Reed-bird (*Emberiza Oryzivora*, L.), in autumn. Mr. ELLIOTT supposed it might be a valuable grass, in overflowed or marshy meadows,—as its leaves, he says, are eaten with avidity by stock of all descriptions. I do not know that it has been found of much importance, in that respect, in the northern or middle States. The grain is gathered by the North-Western Indians by beating it off into their canoes as they sail among the reeds.

4. ALOPECU'RUS, L. FOXTAIL GRASS.

[Greek, *Alopez*, a fox, and *Oura*, a tail ; in allusion to the form of the spike.]

Spikelets 1-flowered. *Glumes* strongly compressed and keeled, awnless, nearly equal, united at base. *Lower palea* equalling or shorter than the



FIG. 250. The Meadow Foxtail (*Alopecurus pratensis*). 251. A spikelet (1-flowered) 252. The floret, consisting of a single awned palea, removed from the glumes.

glumes, *awned* on the back below the middle, *upper palea wanting*. *Styles* commonly united; *stigmas* long and plumose. *Flowers* in a dense, soft, cylindrical terminal *spike*.

1. *A. PRATEN'SIS*, L. Culm erect, smooth; palea equalling the acute glumes; awn exerted more than half its length, twisted.

MEADOW ALOPECURUS. Common or Meadow Foxtail.

Perennial. Culm about 2 feet high, smooth. *Leaves* smooth, flat, the upper one much shorter than its inflated *sheath*. The spike-like *panicle* 1–2 inches long, yellowish green. *Glumes* and *palea* hairy and ciliate.

Meadows; New England and New York. Native of Europe. May.

Obs. This is considered a valuable pasture grass in England, producing a luxuriant aftermath. According to Mr. FLINT, ("Grasses and Forage Plants," a work containing many useful statistics), it is not valued by the Massachusetts farmers, as a field grass, on account of being so light in proportion to its bulk. Two other species are found in the country, but they are of no value in agriculture. *

5. PHLE'UM, L. CATS-TAIL GRASS.

[An ancient Greek name; meaning obscure.]

Paleæ 2, membranaceous, shorter than the mucronate or awned *glumes*; the *lower palea* truncate, usually awnless. *Styles* distinct. Other characters much as in *Alopecurus*. *Culms* somewhat wiry; *spikes* dense and harsh.

1. *P. PRATEN'SE*, L. Spike cylindric, elongated; glumes truncate, mucronately awned,—the awns shorter than the glumes; keel ciliate.

MEADOW PHLEUM. Cats-tail Grass. Herds Grass of New England and New-York. Timothy of Pennsylvania, &c.

Fr. Fléole des Prés. *Germ.* Das Wiesen-lieschgras.

Root perennial, fibrous. *Culm* 2–4 feet high, simple, terete, smooth,—when old rather firm and wiry, and often somewhat bulbous at base. *Leaves* 6–12 or 15 inches long, lance-linear, acute, flat, glaucous, somewhat scabrous; *sheaths* striate, smooth; *ligule* membranaceous, obtuse, finally lacerate. *Spike* 3–6 or 8 inches long, green. *Glumes* equal, compressed, abruptly mucronate, pubescent. *Paleæ* concealed in the glumes, the lower one larger. *Anthers* purple. *Stigmas* white.

Fields and meadows: cultivated. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This foreign Grass is extensively naturalized in the United States. In New-York, and throughout New-England, it is known by the name of Herds Grass,—a name which, in Pennsylvania—and I believe in all the States South—is applied exclusively to *AGROSTIS VULGARIS*, L. The Meadow Phleum, or Timothy, is very generally cultivated in Eastern Pennsylvania; and is undoubtedly one of the most valuable of the "artificial grasses," so called. Mixed in about equal proportions with red clover (*TRIFOLIUM PRATENSE*, L.) it makes the best quality of Hay. It requires a good soil,—and is considered a rather severe and exhausting crop;—inasmuch as the aftermath, or second growth of radical leaves, is somewhat scant and tardy during the dry weather which usually suc-

ceeds harvest ; and thus the ground is left exposed to the injurious influence of the scorching sun. The clover, however, when present in sufficient quantity, soon springs up and affords a shelter to the soil ; and, when the land is good, the green grass (*POA PRATENSIS*, *L.*), comes in,



spontaneously, as the clover disappears. The seed, of Timothy, is usually sown in autumn,—among, and immediately after Wheat and Rye ; though it answers very well, when sown early the ensuing spring.

6. AGROS'TIS, *L.* BENT-GRASS.

[Greek, *Agros*, a field ; its usual place of growth.]

Spikelets in an open panicle, 1-flowered. *Glumes* nearly equal, often longer than the *paleæ*, pointless. *Paleæ* very thin, pointless, naked at the base ; the *lower* 3–5-nerved, sometimes awned on the back, the *upper* often minute or wanting. *Stamens* usually 3. Mostly *perennials* with slender *cæspitose culms*.

1. *A. VULGA'RIS*, *With.* Culms slender, mostly erect ; leaves lance-linear ; panicle loose, ovoid-oblong in its outline,—usually purple ; *paleæ* awnless,—the lower one twice the size of the upper one ; *ligule* truncate, very short.

COMMON AGROSTIS. Herd-grass (of Penn.) Red-top.

Root perennial, creeping. *Culms* *cæspitose*, very slender, erect or ascending, 1–2 feet high. *Leaves* 3–6 or 8 inches long, nerved, scabrous ; *sheaths* striate, smooth. *Panicle* mostly purple—the branches capillary, alternately semi-verticillate, smoothish or often scabrous. *Glumes* smooth, except on the keel, lanceolate, acute, finally expanding. *Paleæ* membranaceous, smooth at base,—the lower one nearly as long as the glumes, the upper one very small, *retuse*.

Pastures and moist meadows : introduced. Native of Europe. *Fl.* July. *Fr.* August.

Obs. This grass is somewhat variable in its botanical characters,—as may be inferred from one of the specific names it has received, viz. : *A. polymorpha*. It is often cultivated in some districts of the country, and answers a tolerably good purpose in wet or swampy meadows, which

FIG. 253. A spikelet of Timothy (*Phleum pratense*). 254. The floret removed from the glumes.

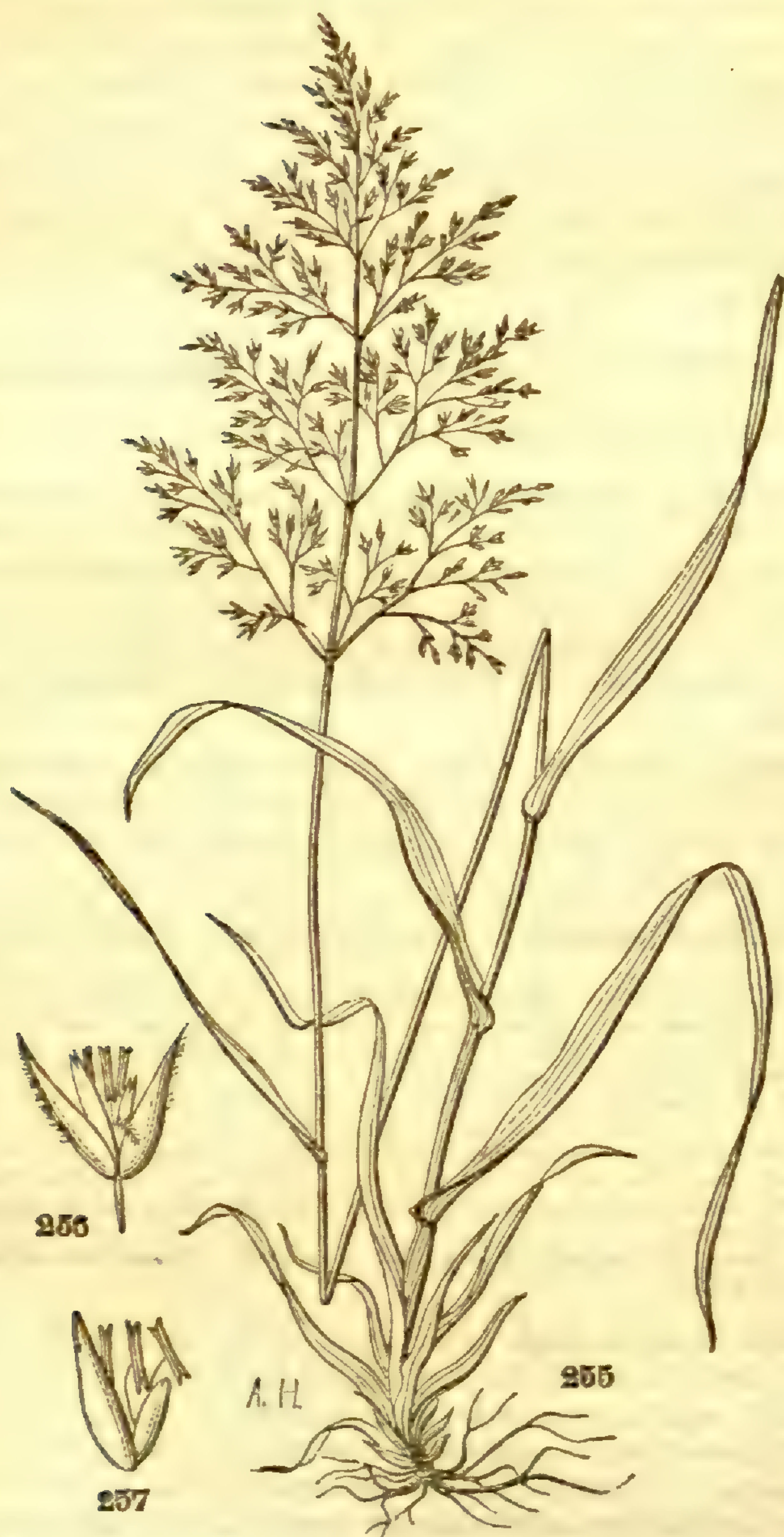


FIG. 255. The Red-top or Herd-grass of Pennsylvania (*Agrostis vulgaris*). 256. A spikelet. 257. The floret removed from the glumes.

its roots tend to consolidate; but it is not among the most esteemed grasses,—either for pasture or hay. It should be borne in mind, by dealers in seeds, that this is *not* the “Herd-grass” of New York and New England,—which is *Phleum pratense*, or Timothy. The whole genus (*Agrostis*,) is known in England by the name of “Bent Grass,” and one of the species (*A. Alba*, L., var. *stolonifera*), was quite celebrated some years ago under the name of “Fiorin Grass,” as being superior to all others for yielding great crops of hay; but like many other plants whose value has been exaggerated, it has nearly ceased to attract notice.

7. MUHLENBERG'IA, Schreber. DROP-SEED GRASS.

[In honor of *Rev. Henry Muhlenberg, D. D.*; an early and eminent American Botanist.]

Spikelets mostly in contracted panicles. *Glumes* acute or bristle-pointed, persistent; the lower rather smaller, sometimes very minute. *Florets* very short stalked, or sessile in the glumes; *paleæ* usually hairy at base, herbaceous, deciduous with the enclosed grain, often equal; the lower one 3-nerved, mucronate or awned at the apex. *Stamens* 3. *Perennials* with branching rigid *culms* from scaly creeping *root-stalks*; *leaves* short and narrow.

1. *M. diffu'sa*, Schreber. Culms slender, diffusely branching; leaves short, spreading; panicles terminal and lateral, contracted and slender; glumes very minute, the lower obsolete; lower palea with an awn once or twice its length.

SPREADING MUHLENBERGIA. Drop-seed Grass. Nimble Will.

Culm 6–12 and 18 inches long, decumbent, geniculate, compressed, very slender and rather wiry, glabrous, much branched—the branches assurgent. *Leaves* 1–2 or 3 inches in length, divaricate, lance-linear, acute roughish; *sheaths* rather open, striate, pubescent at throat; *ligule* very short, finally lacerate or ciliate. *Panicles* 3–6 or 8 inches long, very slender, often purplish—the branches alternate, rather distant, appressed, scabrous; *spikelets* all pedicellate, racemose. *Glumes* persistent, very minute—the lower one a mere rudiment, the upper one truncate, lacinate-dentate. *Paleæ* unequal,—the lower one longer, almost triangular, with 3 prominent, scabrous nerves, and terminating in a slender scabrous awn, which is generally a little longer than the palea itself. *Caryopsis* linear-oblong, acute, brown.

Pastures, yards and borders of dry open woodlands. *Fl.* August–September. *Fr.* September–October.

Obs. This slender grass often appears in considerable quantity in the latter part of summer, in fields which have been kept up some years for pasture. Cattle feed on it; but it is not so valuable as several of the other grasses herein mentioned. It is said to be known in Kentucky by the name of “Nimble Will.” In Pennsylvania it has scarcely been noticed by the farmers sufficiently to acquire a common name.

2. *M. Mexica'na*, Trin. Culms ascending, much branched; panicles terminal and lateral, contracted; glumes acuminate, nearly as long as the paleæ; paleæ nearly equal, pilose at base, very acute, but not awned.

MEXICAN MUHLENBERGIA.

Root perennial, creeping. *Culms* erect or ascending, 1-2 or 3 feet high, slender and wiry, with numerous swelling nodes, much branched and leafy above, often becoming nearly naked below. *Leaves* 2-4 or 5 inches long, lance-linear, acute, nerved, scabrous, especially on the upper surface; *sheaths* smooth, compressed and but partially embracing the culm; *ligule* short, obtuse and lacerate. *Panicles* numerous, 2-3 inches in length, contracted and rather dense-flowered,—the lateral ones partly sheathed at base. *Glumes* narrow-lanceolate, with scarious margins and a subulate point. *Paleæ* usually longer than the glumes (sometimes twice as long), the lower one occasionally terminating in an awn.

Moist grounds, borders of fields and woodlands. *Fl.* August. *Fr.* September.

Obs. This species affords an indifferent pasture in the latter part of summer; but it is not of much worth. It is better to supersede these—and all grasses of inferior quality—by the introduction of more valuable ones, and it can be done by the aid of lime and manure. When the soil is enriched and properly managed, the better kinds of natural Grasses (especially *Poa* and *Festuca*) soon come in spontaneously and expel the others.

8. CALAMAGROS'TIS, *Adans.* REED BENT-GRASS.

[Greek, *Kalamos*, a reed, and *Agrostis*; from its affinity to both.]

Spikelets in an open or contracted, sometimes spiked panicle, 1-flowered, and often with a rudiment or *pedicel* of an abortive *second floret*. *Glumes* commonly nearly equal, keeled, often acute and longer than the floret which is invested at base by a tuft of white hairs. *Lower palea* mostly *awned* on the back; the *upper* shorter, with the rudimentary, often plumose, *pedicel* at its base. *Stamens* 3. *Perennials* with running *root-stocks* and mostly tall, simple rigid *culms*.

1. C. Canaden'sis, Beauv. Panicle loose, oblong, often purplish; lower *palea* rather shorter than the lanceolate acute glumes, not exceeding the very fine hairs, bearing an extremely delicate awn below the middle; rudimentary *pedicel* minute.

CANADIAN CALAMAGROSTIS. Blue Joint-grass. Canadian Small Reed.

Culm 3-5 feet high. *Leaves* 1 foot long and about $\frac{1}{2}$ of an inch wide, flat, glaucous, slightly pubescent above, smoothish underneath. *Awn* scarcely equalling or exceeding the hairs. *Glumes* rough, about $1\frac{1}{2}$ lines long.

Wet grounds: common north and west.

Obs. This species is considered by some as an excellent and nutritious grass. According to WHITNEY'S Geological Report, it is abundant and valued about Lake Superior; the yield is said to be abundant, and it is greedily eaten by cattle.

2. C. arena'ria, Roth. Culm rigid, from long stout running root-stocks; leaves soon involute; glumes nearly equal, keeled; *paleæ* shorter than the glumes, the lower 5-nerved, mucronate or obscurely awned near the tip, surrounded by short hairs at the base; panicle spike-like, contracted; spikelets large.

SAND CALAMAGROSTIS. Sea-Sand Reed. Beach Grass. Mat Grass.

Root-stock often running for 20–30 feet. *Culm* 2–3 feet high. *Leaves* long, near half an inch wide, attenuated to a long slender point, smooth and glaucous. *Panicles* 6–12 inches long, whitish, very close and spike-like. *Spikelets* about $\frac{1}{2}$ an inch in length.

Sea-coast, Maine to New Jersey, and on the shores of Lakes Superior and Michigan. August.

Obs. Although this grass has, properly speaking, no agricultural use, yet it is in some localities a very important and useful one. Along the coast of Massachusetts it is planted to confine the blowing sands. The Federal Government has expended considerable sums in planting this grass for the protection of harbors, and much has been done by State and individual effort. An interesting account showing the important purpose a mere grass can serve, may be found in *Flint's Treatise on Grasses and Forage Plants*. *

9. CY'NODON, Rich. BERMUDA GRASS.

[Greek, literally *Dog's tooth*; but the reason is not obvious.]

Spikes digitate, in pairs, or racemose. *Spikelets* with one perfect floret, and sometimes with the subulate pedicel or abortive rudiment of a second superior floret. *Glumes* keeled, awnless, nearly equal, the upper one exterior. *Paleæ* pointless and awnless; the lower larger, boat-shaped. *Stamens* 3. Low, diffusely branched, creeping *perennials* with short flattish *leaves*.

1. *C. Dac'tylon*, Pers. *Spikes* 3–5, digitate, spreading; *paleæ* longer than the *glumes*, glabrous, with a beardless bristle at the base of the inner one.

FINGER CYNODON. Bermuda Grass. Dog's-tooth Grass.

Root perennial, fibrous, creeping (numerous slender *rhizomas*). *Culm* procumbent, radicate, 6–12 or 15 inches long, terete, smooth. *Leaves* 1–2 or 4 inches long, acute, somewhat distichous and rigid, slightly hairy and scabrous; *sheaths* longer than the internodes, hairy; *ligule* beard-like. *Spikes* 3–5 (usually 4), 1–2 inches long; *rachis* flexuose and angular, not winged. *Scales* obovate, half as long as the ovary. *Stigmas* dark purple.

Loose sandy soils: Southern States: introduced? *Fl.* All summer (*Ell*). *Fr.*

Obs. This I should judge to be a grass of doubtful value, and equivocal character in agriculture, compared with our better species. Mr. ELLIOTT gives the following account of it [under the name of *Digitaria Dactylon*], as observed in South Carolina:—"We have two varieties of this plant, one coarser (perhaps a species) growing in damp soils, native; the other, described above, said to be imported, a tender, delicate grass, growing over and binding the most arid and loose lands in our country, and apparently preferred by stock of all descriptions to every other grass. The cultivation of this grass on the poor and extensive sand hills of our middle country would probably convert them into sheep-walks of great value; but it grows in every soil, and no grass in close rich land is more formidable to the cultivator; it must therefore be introduced with caution." Sir JAMES EDWARD SMITH, the Botanical Editor of Rees' Cyclopædia, has the following remarks [*Art.* PANICUM

dactylon], in reference to the plant: "This grass was perceived by Mr. LAMBERT to be no other than the *Agrostis linearis* of KOENIG, RETZIUS, and WILLDENOW,—the *Durva* of the Hindoos,—which the late Sir WILLIAM JONES, in the fourth volume of the Asiatic Researches, has celebrated for the extraordinary beauty of its flowers, and its sweetness and nutritious quality as pasture for cattle. We cannot but remark what extraordinary celebrity is attached, every now and then, to one grass or other, and how their fame passes away 'like the morning cloud,' while the best graziers scarcely know, perhaps, better than their fat cattle, anything of the nature of the common, never-failing herbage to which they are both so much indebted."

10. ELEUSI'NE, *Gaertn.* CRAB-GRASS.

[From *Eleusis*; where Ceres, the goddess of harvests, was worshiped.]

Spikelets 2–6-flowered, with a terminal naked rudiment, closely imbricated-spiked on one side of a flattish rachis; the spikes digitate or fascicled. *Glumes* unequal, shorter than the florets, keeled, pointless. *Paleæ* awnless and pointless, the lower ovate, keeled; the upper smaller, 2-keeled. *Stamens* 3. *Pericarp* (utric'le) containing a loose wrinkled seed. *Annuals* with low and spreading culms; pale green.

1. *E. IN'DICA*, *Gaertn.* Culm compressed, decumbent; spikes 2–4 or 6, linear, straight, digitate; spikelets lance-ovate, about 5-flowered.

INDIAN ELEUSINE. Dog's-tail Grass. Crow-foot, Crab or Yard Grass.

Root annual. *Culm* 6–12 and 18 inches long, oblique or often nearly procumbent, smooth, branching at base. *Leaves* 2–12 inches long, rather crowded and distichous at the base of the culm, linear, often inclined to be conduplicate, smooth or sparingly pilose; *sheaths* loose, striate, glabrous, pilose at throat; *ligule* very short, truncate, minutely dentate. *Spikes* 2–4, sometimes 6 (rarely 1), 1 or 2–4 inches long; *rachis* compressed. *Spikelets* imbricated, smooth. *Lower palea* ovate-lanceolate, with a green keel,—the upper one a third shorter, with 2 keels. *Caryopsis* triangular-ovoid, dark brown, transversely rugose.

Farm-yards, lanes and along foot-paths. Native of India. *Fl.* August–September. *Fr.* September–October.

Obs. This grass is extensively naturalized, especially southward. It is usually to be seen in abundance in lanes and wood-yards, about farm-houses during the latter part of summer,—where it grows very thick, and forms a fine carpeting in spots which had been previously naked and muddy. Cattle and hogs are fond of it,—and Mr. ELLIOTT commends it for hay; but in this region it rarely grows in mowing grounds to any considerable extent.

There is another species (*E. Coracana*, *Gaertn.*), which is "cultivated as corn, under the name of Natchenny, upon the Coromandel coast." I believe it is unknown in this country,—and probably would not be worth introducing.

11. DAC'TYLIS, L. ORCHARD GRASS.

[Greek, *Daktylos*, a finger ; in reference to the form or size of the spikes.]

Spikelets several-flowered, compressed, crowded in dense one-sided *paniculate clusters*. *Glumes* unequal, acuminate, ciliate-scabrous on the keel. *Paleæ* nearly equal, the 5 nerves of the *lower one* converging into an awn-like point. *Stamens* 3. *Grain* lance-oblong, acute at each end. *Perennials* with stout *culms*, keeled *leaves* and pale-green clustered *spikelets*.

1. D. GLOMERA'TA, L. Panicle distinctly branched, rather secund ; spikelets 3–4-flowered, in dense unilateral clusters at the ends of the branches.

CLUSTERED DACTYLIS. Orchard Grass. Cock's-foot Grass.

Fr. Dactyle pelotonné. Germ. Gemeines Knauel-gras.

Whole plant scabrous. *Root* perennial. *Culm* 2–3 or 4 feet high. *Leaves* 6–18 inches long, lance-linear, keeled, glaucous ; *sheaths* striate ; *ligule* elongated, lacerate. *Panicle* glaucous, contracted, racemose at summit, rather one-sided ; *branches* 3–5, solitary, erect, distant, subdivided towards the extremity. *Spikelets* about 4-flowered, compressed, crowded in dense unilateral ovate or lance-oblong clusters at the ends of the branches. *Glumes* unequal,—the lower one narrower, membranaceous, the upper one 3-nerved, scabrous on the keel. *Lower palea* scabrous, ciliate on the keel, which is extended into a cusp or short scabrous awn ; *upper palea* acuminate, bifid at apex, ciliate on the two green keels,—the margins folded in so as to meet, embracing the stamens. *Caryopsis* lance-oblong, sub-triquetrous, acute at each end.

Fields and orchards : cultivated. Native of Europe. Fl. May. Fr. June.

Obs. This grass has been introduced and cultivated to a considerable extent. Our farmers, however, are not agreed upon its merits. Some condemn it as unworthy of culture either for pasture or hay ; while others set a high value on it for both. The fact seems to be, that it is inferior to Timothy (*PHLEUM PRATENSE*, L.) for hay ; yet it has the advantage of the latter in being mature at the same time with clover,—with which both are usually cultivated. It is also less exhausting to the soil. But its great value is as a pasture, when sown sufficiently thick, which, however, it rarely is,—and hence is apt to form bunches or tussocks. It is of quick growth, and is speedily reproduced after being cut, or eaten down ; so much so that we may almost literally apply to it the lines of VIRGIL :—

“ Et quantum longis carpent armenta diebus
Exigua tantum gelidus ros nocte reponet.”—*Georg.* 2. 201.

“ Cool dews restore beneath night's transient hours,
All that the herd each live-long day devours.”—*Sotheby.*

This grass also possesses the additional advantage of thriving well in the shade of trees, and answers a very good purpose in orchards, &c. The seed is usually sown in autumn, immediately after Wheat or Rye



FIG. 258. Orchard-Grass (*Dactylis glomerata*). 259. A spikelet.

12. GLYCE'RIA, R. Brown. MANNA GRASS.

[Greek, *Glykeros*, sweet ; in allusion to the sweet taste of the seeds.]

Spikes several- or many-flowered ; *florets* oblong, early deciduous by the breaking up of the *rachis* into joints, leaving the persistent, unequal, 1 – 3-nerved *glumes* behind. *Paleæ* nearly equal, naked, somewhat chartaceous ; the *lower one* mostly 7-nerved, usually blunt and scarious at the apex, rounded on the back ; the *upper one* 2-keeled. *Stamens* 2 – 3. *Stigmas* plumose, the hairs dichotomous. *Grain* oblong, free. *Perennial*, smooth semi-aquatic grasses with creeping bases or *root-stocks* and *sheaths* usually nearly entire.

1. *G. flu'itans*, R. Brown. *Spikelets* linear, terete, pale, 7 – 13-flowered, appressed on the branches of the long racemose narrow panicle ; *paleæ* minutely scabrous ; the lower oblong, entire or obscurely 3-lobed, rather longer than the 2-toothed upper one.

FLOATING GLYCERIA. Manna Grass.

Fr. Manne de Prusse. *Germ.* Essbarer Schwingel.

Root perennial, creeping. *Culm* 4 – 6 feet high, erect or ascending, compressed, glabrous. *Leaves* 5 – 8 or 10 inches long, lance-linear, striate, scabrous on the margin and upper surface ; *sheaths* nerved, smooth ; *ligule* very large, oblong, membranaceous, acute or sometimes obtuse. *Panicle* slender, 12 – 15 inches long, usually partly concealed in the sheath of the upper leaf,—the *branches* mostly simple. *Spikelets* about an inch long, nearly sessile, racemose on the branches and appressed. *Glumes* membranaceous, nerveless. *Upper palea* blunt at apex,—the margins folded in, and a green keel at each apparent border. *Caryopsis* oblong, sulcate on the upper side.

Wet low grounds, margins of shallow pools, &c. *Fl.* June. *Fr.* July.

Obs. This stout semi-aquatic grass is common to both hemispheres. The seeds have a sweetish taste, and in some parts of the old world,—where they are known by the name of Manna Seeds—they are used by the poorer peasantry in making soups and gruels. In the United States the country people, as yet, are happily ignorant of all such expedients, and will long continue so, if they have industry enough to cultivate more valuable grains. The herbage of this plant is eaten by stock ; but it is so much confined to wet localities that it is scarcely entitled to be enumerated among the grasses interesting to American farmers.

13. PO'A, L. MEADOW-GRASS.

[An ancient Greek name for herbage or pasture.]

Spikelets ovate or oblong, compressed, few- or several-flowered. *Glumes* mostly shorter than the *florets* ; the lower ones smaller. *Lower palea* membranaceo-herbaceous with a scarious margin, keeled or convex, pointless, 5-nerved (the intermediate nerves obscure or obsolete), the principal nerves with *cobweb-like wool* at their base ; *upper palea* membranaceous, 2-keeled. *Stamens* 2 – 3. *Stigmas* simply plumose. *Grain* oblong, free. *Culms* caespitose ; the *leaves* smooth, usually flat and soft.

* *Root* annual : *branches of the short panicle* single or in pairs.

1. *P. AN'NUA*, L. Culms oblique, subcompressed; leaves rather short; panicle subsecund; spikelets 3–7-flowered, on short pedicels, rather crowded.

ANNUAL POA. Dwarf, or Early Meadow-Grass.

Fr. Paturin annuel. *Germ.* Jaehriges Rispengras.

Root annual. *Culms* caespitose, 3–6 or 8 inches long, smooth, geniculate, oblique at base, or often nearly procumbent. *Leaves* 1–3 inches in length, sublinear, acute, keeled, smooth; *sheaths* loose, smooth; *ligule* oblong, dentate. *Panicle* sometimes rather secund, the branches often solitary, subdivided. *Spikelets* rather crowded on the divisions of the branches, 3 or 4–6- (very often 3-) flowered. *Glumes* unequal, acuminate, with scarious margins. *Lower palea* delicately more or less hairy on the nerves below.

Cultivated grounds, pastures, along foot-paths, &c. : introduced. Native of Europe. *Fl.* April–Sept. *Fr.* June–Oct.

Obs. This little species—which was probably introduced from Europe—comes forward early in the spring,—and what little pasture it affords is tolerably acceptable to stock; but it is far inferior in value and importance to either of the following.

*** Root perennial; panicle open, its branches in fives; spikelets all distinctly pedicelled, acute, slightly flattened.*

2. *P. serot'ina*, Ehrhart. Culms erect terete; leaves linear; ligules elongated; spikelets 2–4-flowered; flowers acutish, often tinged with purple.

LATE POA. Fowl Meadow-Grass. False Red-top.

Culm 2–3 feet high. *Panicle* 6–10 inches long. *Paleæ* slightly hairy at the base. Wet meadows: northward. July–Aug.

Obs. This is considered a highly valuable grass for wet meadows, and is common in New England and along the northern States to Lake Superior.

**** Root perennial; panicle with the flattened spikelets crowded on the branches, mostly short-pedicelled, sometimes almost sessile.*

3. *P. TRIVIA'LIS*, L. Culm and sheaths somewhat scabrous; ligule elongated, acute; spikelets ovate, 2–3-flowered,—the florets slightly villous at base.

TRIVIAL POA. Rough Meadow-Grass.

Root perennial. *Culm* 1–2 or 3 feet high, subterete or slightly ancipital, often declined at base, geniculate, and stoloniferous, somewhat scabrous retrorsely. *Leaves* 2 or 3–6 or 8 inches long, lance-linear (those of the root, or suckers, long and narrow), acute or acuminate, slightly scabrous on the margin; *sheaths* striate-nerved, scabrous when rubbed upwards; *ligule* much elongated, scarious and whitish. *Panicle* loose, expanding,—the branches semi-verticillate in about fives, sharply scabrous. *Spikelets* usually 2- (sometimes 3-) flowered. *Glumes* scabrous on the keel, the lower one rather shorter, very acute, the upper one 3-nerved, with a scarious margin. *Paleæ* unequal, nearly smooth or very slightly villous at base, the lower one longer, 5-nerved, scarious at apex.

Moist low grounds, meadows, and woodlands: introduced? *Fl.* June. *Fr.* July.

Obs. This species (perhaps a foreigner) is frequent in moist pastures and meadows,—and affords a good forage, both pasture and hay. It

has much general resemblance to the following species (*P. pratensis*), when growing in open grounds; but is decidedly inferior in value,—and may be readily distinguished from it, by the elongated ligule and retrorsely scabrous sheaths and culms. In woodlands, it is often a weak straggling plant.

4. *P. pratensis*, L. Culm and sheaths smooth; ligule short, truncate; panicle somewhat crowded, regular, finally spreading; spikelets ovate, acute, 3–5-flowered; florets connected by a villous web.

MEADOW POA. Spear Grass. Green Grass. Smooth Meadow-Grass.

Fr. Paturin des Prés. Germ. Vieh-gras. Wiesen Rispen-grass.

Root perennial, creeping. *Plant* smooth. *Culm* erect, 1–2 or 3 feet high, slender, terete. *Radical leaves* often very numerous, and long (1–2 feet or more in length, in good soils), scarcely a line wide and exactly linear, terminating abruptly in a boat-shaped or keeled point, deep green, slightly scabrous on the margin; the *culm leaves* shorter than the striate nerved glabrous *sheaths*; *ligule* scarious, short, obtuse, often crenate-dentate. *Panicle* at first rather crowded, at length expanding and pyramidal, the branches semi-verticillate, 3–5 from a node, flexuose and nearly smooth. *Spikelets* pedicellate, a little crowded on the branches; 2 or 3–5-flowered; *florets* acute, connected at base by cobweb-like hairs. *Glumes* a little unequal, compressed, keeled, sharply acuminate. *Lower palea* somewhat compressed, acute, 5-nerved, the *upper one* acuminate, slightly scabrous on the two keels.

Fields, meadows, and woodlands: introduced? *Fl.* May–June. *Fr.* July.

Obs. This species varies considerably, in size and appearance, when growing in different soils and situations. In our best soils, the radical leaves are very long and luxuriant,—when it is known by the name of “Green Grass.” In Kentucky, it is commonly called “Blue Grass,”—a name which properly belongs to the following species (*P. compressa*, L.). It is the profusion of the nutritious radical leaves, which constitutes the chief excellence of this grass. It is, indeed, as MUHLENBERG terms it, “*optimum pabulum*,”—being decidedly the most valuable of all the grasses known in our pastures. It has not been found necessary, in Pennsylvania (of latter years, at least), to cultivate it, by sowing the seed; for when the land is duly prepared by lime and manure, it soon takes possession of the soil—or comes in, as the farmers term it,—and supersedes the artificial grasses. The prevalence, therefore, and luxuriant growth of this grass, is one of the best evidences of the land being in good condition, and well managed. In very poor land, it deteriorates so much that it would scarcely be recognized as the same plant. The slender culms, of this species, afford an excellent material for the manufacture of the finer kinds of Leghorn hats.

5. *P. compressa*, L. Culm oblique or declined at base, much compressed; panicle contracted, somewhat secund; spikelets oblong-ovate, 3–6-flowered; florets connected by a villous web.

COMPRESSED POA. Blue Grass. Wire Grass. Flat-stalked Meadow-Grass.

Fr. Paturin applati. Germ. Rehwesen.

Root perennial, creeping (numerous branching *rhizomas*). *Plant* smooth with rather



few and short radical leaves. Culm 9-18 inches long, often procumbent and radicating at base. Leaves 2 or 3-5 or 6 inches long, linear, keeled, roughish near the end, and

FIG. 260. Common Meadow-Grass (*Poa pratensis*). 261. A spikelet. 262. A pistil removed from the paleae, showing the scales at the base of the ovary.

with the culm of a bluish-green or glaucous hue; *sheaths* rather loose, striate; *ligule* short, obtuse. *Panicle* contracted, at first almost spicate and rather secund, finally a little expanding; the *branches* by twos and threes, short, somewhat flexuose and scabrous. *Spikelets* generally 5-6-flowered, subsessile. *Glumes* nearly equal, acute, serrulate on the keel. *Lower palea* minutely pubescent, often dark purple near the apex, with a narrow white scarious margin; *upper palea* scabrous on the two keels. *Caryopsis* oblong, reddish-brown.

Upland fields and pastures. *Fl.* June. *Fr.* July.

Obs. This species—which, though rarely if ever cultivated, yet finds its way into most pastures—is not held in so high estimation, by our farmers, as the one next preceding,—and certainly falls far short of it, in the quantity of herbage afforded; but that which is afforded is, in my opinion, even more nutritious. Cows which feed on it, yield the richest milk, and finest butter. The creeping roots (or rhizomas) are remarkably tenacious of life,—and in consequence, are sometimes rather troublesome, in cultivated grounds, among other crops; but, on the whole, it is an excellent grass—especially in dairy and sheep pastures. It seems rather probable that this—as well as all the preceding species—has been introduced from Europe, although they are found in some situations where they appear to be indigenous.

14. FESTU'CA, L. FESCUE-GRASS.

[The ancient Latin name.]

Spikelets rather dry and harsh, 3-many-flowered, paniced or racemose; *florets* not cobwebby at base. *Glumes* unequal, mostly keeled, shorter than the *florets*. *Lower palea* subcoriaceous, convex on the back, not scariously margined, more or less 3-5-nerved, acute, pointed, often bristle-awned; the *upper one* adhering to the grain in most of the species, but free in the one mentioned here. *Stamens* mostly 3.

1. F. ELA'TIOR, L. *Panicle* contracted before and after flowering, branches short; spikelets crowded, 5-10-flowered; the *florets* rather remote, oblong-lanceolate, awnless.

TALLER FESTUCA. Tall Fescue. Meadow Fescue.

Plant glabrous. *Root* perennial. *Culm* 2-3 feet high. *Leaves* 4-6 or 8 inches long (the *radical leaves* numerous and longer), lance-linear, acuminate, nerved, shining beneath, scabrous on the margin; *sheaths* nerved; *ligule* very short or obsolete. *Panicle* 4-6 or 8 inches long, somewhat secund, mostly erect, the *branches* generally single, but often subdivided. *Spikelets* about 7-flowered, racemose on the branches, often purplish. *Glumes* unequal, the lower one keeled, the upper one larger, 3-nerved, scarious on the margin. *Lower palea* obscurely 5-nerved, somewhat acute but not acuminate nor mucronate; *upper palea* white, with 2 green keels, and the margins doubled or folded in.

Fertile pasture fields and meadows, road-sides, &c.: introduced. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This is a valuable grass—commonly mingled with *Poa pratensis*, L., in good soils; but easily distinguished from that plant, by its tapering slender-pointed shining leaves. It is extensively naturalized in the middle and northern States; and although I have never known it to be cultivated, it soon finds its way into all rich pasture lands. There

seem to be no good characters to distinguish this from *F. PRATEN'SIS*, *Huds.* We have a few native species of *Festuca*,—but they are of little or no value in Agriculture—and some of them are indicative of a poor soil.

15. BRO'MUS, L. BROME GRASS.

[Greek, *Broma*, food ; *Bromus* was an ancient name for oats.]

Spikelets 5—many-flowered in a loose panicle. *Glumes* unequal, membranaceous ; the *upper* 3—9-nerved, the *lower* 1—5-nerved. *Lower palea* convex on the back, 5—9-nerved, *awned* from below the mostly 2-cleft apex. *Upper palea* pectinate-ciliate on the two keels, finally adhering to the groove of the linear-oblong grain. *Stamens* 3. Coarse grasses with large spikelets which are finally nodding.



1. *B. secali'nus*, L. Panicle spreading, even in fruit ; spikelets ovate-oblong, 8—10-flowered ; florets pubescent ; awn short, sometimes very short or none.

RYE BROMUS. Cheat. Chess. Brome Grass.

Fr. Brome Seigle. *Germ.* Roggen-Trespe. *Span.* Bromo.

Root annual. *Culm* 3—4 feet high, smooth. *Leaves* 6—12 inches long, lance-linear, nerved, scabrous and pilose on the upper surface ; *sheaths* nerved, smooth ; *ligule* oblong, retuse, lacinate-dentate. *Panicle* 4—6 or 8 inches long, the *branches* semi-verticillate, nearly simple, scabrous and pubescent. *Florets* a little remote at base, so as to appear distinct on the flexuose rachis. *Lower glume* shorter, 5-nerved, sometimes mucronate,—the *upper one* 7-nerved, obtuse or emarginate. *Lower palea* obscurely 7-nerved, slightly pubescent near the apex,—the *awn* mostly shorter than the floret, flexuose (sometimes want-

ing, or a mere rudiment) ; *upper palea* linear, awnless, pectinate-ciliate on the keel at each border, the scarious margins being folded in. *Caryopsis* closely embraced by the lower palea, grooved on the sides with the upper palea doubled in the groove, and adherent.

Cultivated grounds, chiefly among wheat and rye : introduced. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This foreigner is a well-known pest among our crops of Wheat and Rye,—and occasionally appears in the same fields, for a year or two, after the grain crop ; but being an annual, it is soon choked out by the perennial grasses.—and the fallen seeds remain, like myriads of others, until the ground is again broken up, or put in a favorable state for their developement. The best preventive of this and all similar evils, in the grain-field, is to sow none but good clean seed.

Among the curious vulgar errors which yet infest the minds of credulous and careless observers of natural phenomena, may be mentioned the firm belief of many of our farmers (some of them, too, good practical farmers), that this troublesome grass is nothing more than an accidental variety, or casual form, of degenerate Wheat,—produced by some untoward condition of the soil, or unpropitious season, or some organic

FIG. 263. A spikelet of Chess or Cheat (*Bromus secalinus*).

injury:—though it must be admitted, I think, by the most inveterate defender of that faith, that in undergoing the metamorphosis, the plant is surprisingly uniform in its vagaries, in always assuming the exact structure and character of *Bromus*!

A similar hallucination has long prevailed among the peasantry of Europe, in relation to this supposed change of character in the Grasses. But, in the Old World, they were even more extravagant than with us; for they believed that Wheat underwent sundry transmutations,—first changing to Rye—then to Barley—then to *Bromus*,—and finally from *Bromus* to Oats! I believe the most credulous of our countrymen have not been able, as yet, to come up with their transatlantic brethren, in this matter. This grass has been cultivated within a few years as Willard's *Bromus*, and the seed sold at a high price. The farmers found that they not only did not get a valuable grass, but were really propagating a worthless and pernicious weed, being thus doubly cheated.

2. *B. racemo'sus*, L. Panicle erect, contracted in fruit; lower palea decidedly exceeding the upper, bearing an awn of its own length.

RACEMED BROMUS. Upright Chess. Smooth Brome Grass.

Stem more slender than in chess. *Sheaths* hairy, in other respects resembling it. According to Mr. Flint, the most reliable distinction between this and chess, (for which it is often mistaken,) is that the summit of the *large glume* reaches midway between the summit and the base of the *third floret* in the spikelet; while in chess it only comes to the middle of the *second floret*.

Common in grain fields. Native of Europe. June.

Obs. This is a worthless species found in grain fields, as is *B. mollis*, which resembles the preceding, but has long awned flowers which, as also the leaves, are downy, and the spikelets are closely imbricated. By some, the two are considered as forms of the same species. There are two native species of the genus, of no agricultural value.

16. PHRAGMITES, Trin. REED.

[Greek, *Phragmos*, a partition or hedge; from the use said to be made of it.]

Spikelets 3–7-flowered; *florets* distichous, rather distant, not hairy at base,—the lowest one neuter or with a single stamen, the others perfect; *rachis* clothed with long silky hairs. *Glumes* keeled, acute, membranaceous, shorter than the florets, very unequal. *Paleæ* membranaceous, the lower one thrice the length of the upper, narrow-subulate—the upper one 2-keeled. *Stamens* 3. *Grain* free. *Perennial* grasses with tall simple *culms*, broad *leaves* and large terminal *panicles*.

1. *P. commu'nis*, Trin. Panicle large, loosely expanded; spikelets 3–5-flowered.

COMMON PHRAGMITES. Reed Grass.

Fr. Roseau à balais. Germ. Gemeines Rohr. Span. Caña.

Culm 8–12 feet high, and often an inch or more in diameter at base, nodose, terete, glabrous. *Leaves* 1–2 feet long, and about 2 inches wide at base, linear-lanceolate, attenu-

ated at apex, glaucous, scabrous on the margin; *sheaths* closely embracing the culm, smooth; *ligule* very short, pilose or fimbriate. *Panicle* terminal, large,—the branches smoothish, long, slender, semi-verticillate, with a tuft of soft hairs at base. *Spikelets* lance-linear, erect, pedunculate, 3–5- (mostly 3-) flowered. *Lowest floret* staminate, sessile, naked at base; *upper florets* pedicellate,—the *pedicels* finally clothed with long white silky hairs which are nearly as long as the florets (these hairs scarcely perceptible on the young panicle). *Paleæ* very unequal,—the lower one with a long slender acumination, which is involute, resembling an awn.

Margins of swamps and swampy streams. *Fl.* August. *Fr.* September.

Obs. This grass appears to be indigenous in both hemispheres. It possesses but little agricultural interest; yet, being so remarkably large (rivalling Indian Corn in size), I have concluded to give it a place here.

17. ARUNDINARIA, *Mx.* CANE.

[Name formed from *Arundo*, a reed.]

Spikelets compressed, 5–14-flowered; florets somewhat separated on the jointed rachis. *Glumes* membranaceous, very small, the lower one smaller than the upper. *Paleæ* herbaceous, or somewhat membranaceous; the lower convex on the back, not keeled, mucronate or bristle-pointed. *Scales* 3, longer than the ovary. *Stamens* 3. *Grain* oblong, free. Tall arborescent or shrubby *grasses*, simple or fasciculately branched; spikelets in panicles or racemes, *polygamous*.

1. *A. macrosperma*, *Mx.* Leaves linear-lanceolate, pubescent beneath; panicle simple; spikelets few, very large.

LONG OR LARGE-SEEDED ARUNDINARIA. Cane.

Root perennial, caespitose (creeping rhizomas). *Culm* 3–15 feet high (30 feet or more in the gigantic variety), terete, glabrous, fistular, rigid, branching towards the summit,—the branches distichous. *Leaves* distichous, lanceolate, large, flat, slightly acuminate, pubescent on the under surface; *sheaths* much longer than the internodes, marcescent,—the throat contracted; *ligule* bristly. *Panicle* simple,—the peduncles about an inch long, pubescent. *Spikelets* 1–3 inches in length.

Rich, occasionally inundated, soils: South-Western States. *Fl.* March–April. *Fr.*

Obs. Having only seen the small variety of this species, as it grows in the vicinity of the Dismal Swamp, Virginia,—I cannot speak, from personal observation, of the arborescent variety which forms the celebrated Cane brakes of the Mississippi region. Although this remarkable grass has but little connection with Agriculture, I have supposed it might be entitled to a brief notice; for which I am indebted to Mr. ELLIOTT's valuable sketch of the Botany of South Carolina and Georgia. The culms of this species are well known from their common use as angling rods.

18. LOLIUM, *L.* DARNEL.

[The ancient Latin name.]

Spikelets many-flowered, solitary on each joint of the continuous *rachis*, the edge of the spikelets placed towards the rachis. *Glumes* (except at

the terminal spikelet) only one and that on the outer side :—otherwise much resembling *Triticum*.

1. *L. PEREN'NE*, *L.* Spikelets compressed, linear-lanceolate, longer than the glumes, about 7-flowered,—the florets mostly awnless.

PERENNIAL LOLIUM. Ray-grass, or Rye-grass. Darnel.

Fr. Ivraie vivace. *Germ.* Ausdauernder Lolch. *Span.* Joyo.

Root perennial, creeping. *Culm* 1–2 feet high, smooth. *Leaves* 4–8 or 10 inches long, lance-linear, shining green, smooth, somewhat scabrous near the end; *sheaths* striate, glabrous; *ligule* truncate. *Spike* about 6 inches long,—the *rachis* flexuose, channelled or concave opposite the spikelets. *Spikelets* 12–18 or 20, a little distant, alternately on opposite sides of, and with their edges to, the *rachis*. *Glumes* one to each spikelet (except the terminal one), lance-linear, acute, nerved, resembling a short rigid leaf. *Lower palea* rather obtuse, obscurely 5-nerved; *upper palea* a little longer, ciliate-serrulate on the two prominent keels.

Meadow banks and grass lots : introduced. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This grass—which seems to be much esteemed in Europe—has been partially introduced into this country, and has become naturalized in many places,—though I believe it has been but little cultivated, by our farmers. It affords a valuable pasture where the soil is rich,—in such situations producing radical leaves in great luxuriance; and makes a handsome sward for yards and lawns.

There is another species in Europe, (*L. temulentum*, *L.*, supposed to be the “infelix Lolium,” of VIRGIL—the “Darnel,” of the English),—of which the seeds are said to be somewhat poisonous. If so, it is the only instance known, in all the Gramineæ, in which the sound seeds are of that character.

The Italian Ray Grass has been extensively distributed through the agency of the Patent Office, and is probably a variety of the above or some other species; great superiority is claimed for it in Europe, but not enough is known of it, in our climate, to decide whether it is equal to the grasses already in cultivation.

19. TRIT'ICUM, *L.* WHEAT.

[Latin, *tritus*, a rubbing or grinding; the grain being so treated.]

Spikelets 3—several-flowered, compressed, with the flat side against the *rachis*. *Glumes* nearly equal and opposite. *Lower palea* very like the glumes, convex, awned or merely mucronate; the *upper one* flat, bristly-ciliate on the 2 keels, free or adherent to the groove of the grain. *Stamens* 3. *Annuals* or *perennials*, the former furnishing bread-corn.

* *Annual* : spike 4-sided : glumes ventricose, obtuse. (TRUE WHEAT.)

1. *T. VULGA'RE*, *Vill.* Spike imbricated, with a tough *rachis*; spikelets 4–5-flowered, rather crowded, broad-ovate, obtuse; glumes ventricose, mucronate, compressed at apex; lower palea awned, mucronate, or awnless; grain free.

COMMON TRITICUM. Wheat. Winter Wheat. Spring Wheat.

Fr. Le Froment. Blé. *Germ.* Gemeiner Waizen. *Span.* Trigo.

Root annual. *Culm* 2 or 3-5 feet high, terete, smooth,—the *nodes* striate, pubescent. *Leaves* 6-15 inches long, lance-linear, nerved smooth or slightly scabrous on the upper surface; *sheaths* nerved, smooth; *ligule* truncate, dentate. *Spike* 3-5 inches long, dense, 4-sided, mostly simple, finally nodding; *rachis* compressed, broad, hirsute on the margin. *Spikelets* sessile, broad, compressed at apex. *Glumes* ventricose, boat-shaped at apex. *Florets* usually 3 fertile and 2 abortive,—the penultimate one pistillate, the terminal one neutral and pedicellate. *Paleæ* nearly equal,—the lower one ventricose, awned or mucronate, the upper one folded, ciliate on the two keels. *Caryopsis* ovoid-oblong, sulcate on the upper side, yellowish or brown.

Fields: cultivated. Native country uncertain,—perhaps Persia. *Fl.* June. *Fr.* July.

Obs. Although it has been estimated that more human beings are nourished by Rice, than by any other grain,—yet it is probable that Wheat is the most intrinsically valuable of all the Cerealia, or grain-bearing grasses. It is to this plant that civilized man—especially in the temperate latitudes—is emphatically indebted for his bread; and it is consequently a prominent object of attention with the practical agriculturist. The variety, called “Spring Wheat,” is occasionally, but rarely, cultivated in this country,—while the “Winter Wheat” is cultivated everywhere, throughout the northern, middle, and western States. A plant that has been so long under culture, in almost every kind of soil and climate, of course presents specimens of various character, and aspect;—such as bearded, beardless, red-chaff, white-chaff, &c., and the color of the grain also, varies from whitish, or yellowish, to brown. These fixed characters, or permanent varieties of the plant (called races by the Botanists), have all, in their turn, been favorites with the farmers,—according as they were best adapted to the market, or the place of growth—or best resisted the ravages of the “Hessian fly.” A bearded variety, with a brown grain, called “Mediterranean Wheat,” is the favorite one in some localities. In remarking on the character of the grain, M’CULLOCH says, “the finest samples of Wheat are small in the berry (caryopsis), thin skinned, fresh, plump, and bright, slipping readily through the fingers.”

One species of *Triticum* (*T. turgidum*, L.) is said to be cultivated in Italy, solely for the manufacture of Leghorn or straw hats.

**** Perennials: spikes mostly 2-ranked: glumes lanceolate or linear-oblong, often acuminate.**

2. *T. re’pens*, L. Rhizomas creeping; spikelets 4-8-flowered, awn none, or not more than half the length of the floret; leaves flat.

CREEPING TRITICUM. Couch-grass. Quitch-grass.

Fr. Chien-dent. *Germ.* Gemeine Quecke.

Root perennial,—a white, jointed, creeping *rhizoma*. *Culm* about 2 feet high, smooth. *Leaves* 4-8 or 12 inches long, lance-linear, nerved, scabrous and somewhat pilose on the upper surface; *sheaths* nerved, smooth; *ligule* short, truncate. *Spike* 3-5 inches long; *rachis* flexuose, compressed, scabrous on the margin. *Glumes* keeled, strongly nerved, roughish,—the outer margin broader. *Florets* alternate, a little distant. *Lower palea* 5-nerved, mucronate, smooth; *upper palea* obtuse, ciliate-serrate on the two keels.

Meadows, pasture lots, &c.: introduced. Native of Europe. *Fl.* July. *Fr.* August.

Obs. This species—which is quite distinct in habit from the genuine

Wheat—has found its way into some districts of our country ; and is a troublesome pest in cultivated grounds, when fully introduced,—by reason of the great tenacity of life in its rhizomas, or creeping subterranean stems. In some localities this may afford an acceptable pastur-



FIG. 264. Couch- or Quitch-Grass (*Triticum repens*).

age—where other grasses will not thrive—but in the northern States it is considered desirable to keep our farms as clear of it as possible.

20. SECA'LE, L. RYE.

[Latin, *secare*, to cut ; or perhaps from the Celtic, *Sega*, a sickle.]

Spikelets 2-flowered,—arranged as in *Triticum*. *Glumes* sub-opposite, keeled. *Lower palea* awned at apex, keeled, with unequal sides—the outer side broader and thicker ; *upper palea* shorter, 2-keeled. *Scales* 2, entire, ciliate. *Stamens* 3. *Grain* free, hairy at summit. A tall annual, bluish-glaucous grass with long-awned *florets*.

1. S. CEREAL'LE, L. Spikes compressed, linear ; glumes subulate, scabrous ; paleæ smooth,—the lower one bristly-ciliate on the keel and exterior margin.

HARVEST SECALE. Rye. Common Rye.

Fr. Le Seigle. Germ. Gemeiner Roggen. Span. Centeno.

Culm 4–6 feet high, glabrous, hairy near the spike. *Leaves* 6–18 inches long, lance-linear, smooth beneath, roughish above and on the margin, glaucous ; *sheaths* membranaceous, nerved, smooth ; *ligule* short, dentate. *Spike* 4–6 inches long, 2-sided and flattish, linear. *Spikelets* mostly 2-flowered, with an awn-like rudiment of a third. *Glumes* a little distant from the *florets*, opposite, scabrous, bristly-pilose at base. *Lower palea* ventricose, acuminate, compressed at apex, 5 nerved, terminating in a long scabrous awn ; *keel* and *exterior margin* bristly-ciliate,—the *inner margin* not ciliate, and the nerves on that side less conspicuous ; *upper palea* lanceolate, acuminate, often bifid at apex, sparingly ciliate on the 2 keels. *Grain* oblong, sub-cylindrical, grooved on the upper side, hairy at summit ; dusky brown.

Fields : cultivated. Native of the East. Fl. June. Fr. July.

Obs. This cereal grass seems to do best in light sandy soils. The grain in such soils is of a better quality, and affords a whiter flour. Rye comes nearer to Wheat, in bread-making qualities, than any other grain,—but is, nevertheless, decidedly inferior to it. It is the principal bread-corn of the northern parts of Europe—especially of Russia and Germany.

The seed is subject—particularly in wet seasons—to become diseased, and enlarged,—producing what is called Ergot, or spurred Rye. This diseased grain is injurious to health, when made into bread ; but has been found to possess important medical properties, in certain cases, when judiciously administered.

21. HOR'DEUM, L. BARLEY.

[An ancient Latin name ; of obscure derivation.]

Spikelets 1-flowered, with a subulate rudiment of a second floret—arranged in threes at the joints of the rachis, the lateral ones mostly abortive. *Glumes* lance-linear, flat, rigid, subulate-awned, collateral in front of the spikelets, 6 in number, forming a kind of involucre. *Paleæ* herbaceous,—the lower one concave, produced into a long awn at apex. *Stamens* 3. *Grain* hairy at summit, oblong, sulcate on the upper or inner side, adherent to the paleæ, or rarely free.

1. *H. VULGA'RE, L.* Spikelets all fertile, awned,—the florets arranged so as to form a nearly four- (or somewhat 6-) sided spike.

COMMON HORDEUM. Barley. Four-rowed Barley.

Fr. Orge commune. *Germ.* Gemeine Gerste. *Span.* Cebada.

Root annual. *Culm* 2–3 feet high, smooth. *Leaves* 6–15 inches long, lance-linear, keeled, striate, smoothish; *sheaths* nerved, smooth, auriculate at throat; *ligule* very short. *Spike* about 3 inches long, rather thick and somewhat 4-sided; *rachis* compressed, smooth, pubescent on the margin.

Fields: cultivated. Native of Sicily and Tartary. *Fl.* May. *Fr.* June.

Obs. The ternate spikelets of this species being all fertile, the spike often assumes somewhat of a six-sided appearance; and I understand that in Western New-York—the great Barley region of this country—it is usually called Six-rowed Barley,—though that name would seem more properly to belong to another nearly allied species (*H. hexastichum, L.*)—if, indeed, it be really distinct. This and the following species are cultivated extensively in the middle and northern States—and almost exclusively for the Breweries. The grain is rarely given to cattle,—and Barley bread is unknown in the United States. The plant requires a good soil,—and hence serves as a kind of index to the quality of the farms in Pennsylvania: the fallow crop on good land being generally Barley,—while the occupants of a poor soil have to be content with a crop of Oats.

2. *H. DIS'TICHUM, L.* Lateral spikelets sterile, awnless,—the fertile ones awned, distichous or forming a two-sided spike.

DISTICHOUS HORDEUM. Two-rowed Barley.

Root annual. *Culm* 2–3 feet high, smooth. *Leaves* 6–15 inches long, lance-linear, nerved, scabrous on the upper surface; *sheaths* nerved, smooth, with 2 lanceolate, auriculate appendages at throat; *ligule* short, truncate. *Spike* 3–4 inches long, compressed or ancipital, linear; *rachis* flattened, smooth, hirsute on the margin. ●

Native of Tartary. *Fl.* June. *Fr.* July.

Obs. This species is something later than the preceding, in coming to maturity; and on that account is preferred by many farmers in Pennsylvania,—as it interferes less with their Hay crops. It also stands better than the preceding, after it is ripe,—and yields a heavier grain—though not a greater quantity. The seed, of both species, is usually sown (in Pennsylvania) about the last of March.

22. AVE'NA, L. OAT.

[The classical Latin name.]

Spikelets 2 – many-flowered in a loose, large and somewhat nodding panicle; the *florets* herbaceo-chartaceous, of a firmer texture than the glumes, somewhat distant; the terminal one abortive. *Glumes* somewhat unequal, loose and membranaceous. *Lower palea* convex on the back, 5–9-nerved, with a bent or twisted awn (proceeding from the middle nerve

only) on the back. *Stamens* 3. *Grain* oblong, grooved on the upper side, hairy at summit, free but invested by the upper palea.

1. *A. SATI'VA*, *L.* Panicle regular; spikelets 2-flowered, pendulous; florets shorter than the glumes, naked at base.

CULTIVATED AVENA. Oats. Common Oats.

Fr. Avoine cultivée. *Germ.* Gemeiner Hafer. *Span.* Avena.



Root annual. *Culm* 2-4 feet high, smooth. *Leaves* 6-15 inches long, lance-linear, nerved, scabrous; *sheaths* striate, smooth, rather loose; *ligule* lacerate. *Panicle* loose, somewhat nodding,—the *spikelets* all pedunculate, pendulous. *Lower floret* mostly awned on the back; *upper floret* awnless, with a *pedicel* at the base of the upper palea, bearing at its summit membranaceous rudiments of a third floret. *Grain* closely invested by the smoothish shining sub-cartilaginous paleæ.

Fields: cultivated as a fallow crop. *Fl.* July. *Fr.* August.

Obs. The native country of this plant—as of most of our cultivated grains—seems to be somewhat uncertain,—though this one is said to have been found native in the island of Juan Fernandez. Oats are ex-

FIG. 265. A spike of 2-rowed Barley (*Hordeum distichum*). 266. A cluster of 3 spikelets, the central one fertile, the two lateral ones sterile.

tensively cultivated, in this country,—chiefly as food for horses. Dr. JOHNSON took occasion, in compiling his Dictionary, to fling a sarcasm at the Scotch, by defining oats to be the food of horses in England, and of men in Scotland—as if the effects of climate were a fit subject on which to taunt a people! Yet this was but one of many instances of his national prejudice and illiberality.

This grain succeeds better than Barley, in a thin soil; and is there-



fore frequently employed, in the rotation of crops, when Barley would have been preferred, had the land been good. The *A. NUDA*, *L.*, called "skinless oats,"—a species nearly allied to this, but with 3–5-flowered spikelets, and the caryopsis loosely covered by the paleæ,—has been partially cultivated, by the curious, on account of its superior fitness for making Oat-meal, as an article of diet for the sick.

23. *ARRHENATHE'RUM*, Beauv. OAT-GRASS.

[Greek, *Ahrrhen*, male, and *Ather*, awn; the staminate floret being awned.]

Spikelets 2-flowered with the rudiment of a third, *terminal* one; *middle*

FIG. 267. A 3-flowered spikelet of the Oat (*Avena sativa*), the two lower flowers fertile, the lowermost awned, the uppermost abortive. 268. The pistil removed to exhibit the scales at the base of the hairy ovary.

flower perfect, with its *lower palea* convex with a short *awn* near the apex; *lowest floret* staminate only, bearing a long bent *awn* on the back below the middle; otherwise nearly as in *Avena*.

1. *A. AVENA'CEUM*, *Beauv.* Leaves flat; panicle linear-oblong, contracted, finally spreading; glumes unequal, the lower one shorter than the florets.

OAT-LIKE *ARRHENATHERUM*. Oat-grass. Grass of the Andes.

Fr. Avoine élevée. *Germ.* Wiesen Hafer.

Root perennial, creeping, nodose. *Oulm* about 3 feet high, glabrous. *Leaves* 4–8 or 10 inches long, lance-linear, scabrous on the margin and upper surface; *sheaths* striate, smooth; *ligule* short, retuse. *Panicle* linear-oblong, finally spreading and somewhat nodding,—the branches short, semi-verticillate.

Cultivated lots: introduced. Native of Europe. *Fl.* May. *Fr.* July.

Obs. This grass has been partially introduced, and cultivated, by a few curious farmers; but it does not appear to be much of a favorite, either for pasture or hay, in Pennsylvania. It is sometimes called “Grass of the Andes,”—but I know not for what reason, as it seems to be of undoubted European origin.

FLINT in his treatise upon Grasses, speaks favorably of this grass, remarking that “it is esteemed by those who know it for its early, rapid and late growth, making it well calculated for a late pasture grass.”

24. *HOL'CUS*, *L.* VELVET-GRASS.

[An ancient Greek name, of obscure derivation.]

Spikelets crowded in an open panicle, 2–3-flowered; *florets* jointed with their pedicels, somewhat remote, enclosed and exceeded by the membranaceous boat-shaped *glumes*. *Lower floret* perfect, but its thin lower *palea* awnless; *upper flower* staminate only, with a bent *awn* below the tip. *Stamens* 3. *Styles* plumose to the base. *Grain* free, smooth.

1. *H. lana'tus*, *L.* Softly hoary pubescent; panicle oblong, rather contracted; awn of the staminate floret recurved, included in the glume.

WOOLLY *HOLCUS*. Velvet-grass. Feather-grass. White Timothy.

Fr. Houque laineuse. Foin de mouton. *Germ.* Wolliges Honig-gras.

Root perennial. *Oulm* simple, 18 inches to 2 feet high. *Leaves* lance-linear, acute, 2–5 or 6 inches long; *ligule* white, truncate, dentate. *Panicle* oblong, somewhat dense,—the branches hairy. *Glumes* roughish-pubescent, whitish, often tinged with purple. *Florets* both pedicellate, smooth and shining. *Paleæ* of the perfect floret nearly equal in length, the lower one broader, keeled,—of the staminate floret unequal, the lower one larger, keeled, with a recurved or hooked awn on the back near the apex.

Moist meadows: introduced. Native of Europe. *Fl.* June. *Fr.* July.

Obs. This grass is naturalized in many places in Pennsylvania. Some

of the farmers in Virginia speak favorably of it ; but I think it must be from want of familiarity with more valuable kinds. It is true, that MUHLENBERG praises it—calling it “*excellens pabulum*” ; but it is certain-



FIG. 269. Velvet Grass (*Holcus lanatus*).

ly very little esteemed by our farmers ; and in this they concur in the opinion expressed by Mr. G. SINCLAIR, in his valuable *Hortus Gramineus*.

25. ANTHOXAN'THUM, L. SWEET-SCENTED VERNAL GRASS.

[Greek, *Anthos*, flower, and *anthos*, of flowers ; flower of flowers.]

Spikelets in a condensed, spike-form panicle ; each spikelet 3-flowered, but the *lower two* (or apparently lateral) florets neutral, consisting merely of a narrow *palea*, which is hairy and *awned* on the back. *Perfect floret* diandrous, with 2 short, smooth, shining paleæ. *Glumes* thin, acute, keeled, the upper about as long as the flowers and twice the length of the lower. *Grain* smooth, adherent to and enclosed by the paleæ.

1. A. ODORA'TUM, L. Panicle contracted into an oblong spike ; spikelets sub-pedunculate, spreading, pubescent ; paleæ of the neutral florets ciliate.

FRAGRANT ANTHOXANTHUM. Sweet-scented Vernal Grass.

Fr. Flouve odorante. Germ. Das Rusch-gras.

Root perennial. *Culm* erect, 12–18 inches high, rather slender. *Leaves* lance-linear, shortish (1 or 2–5 or 6 inches long), pubescent ; *sheaths* nerved, sulcate ; *ligule* elongated, membranaceous. *Panicle* a sort of loose spike 1–2 or 3 inches long, becoming yellow when mature ; *spikelets* somewhat fascicled, on short peduncles. *Paleæ* of the *perfect floret* very short, obtuse, nearly equal, smooth and shining, the lower one much broader. *Paleæ* of the *neutral florets* single, linear-oblong, ciliate on the margins,—one of them with a geniculate awn from near the base, more than twice as long as the palea, the other with a straight awn about as long as the palea, inserted on the back near the summit. *Anthers* linear, large. *Stigmas* white. *Grain* oblong, blackish, shining.

Meadows and moist open woodlands : introduced. Native of Europe. Fl. May–June. Fr. July.

Obs. This has been much noticed, in Europe, as a fragrant meadow-grass ; but it seems rather to belong to a moist, cold, thin soil,—and is by no means regarded, in the United States, as a grass of superior value. When cut, and partly dry, it emits a fragrant odor ; often remarkable in new mown hay. The culms have been used in the manufacture of imitation Leghorn hats and bonnets.

This grass is the plant referred to by Dr. DARWIN, in the following lines of his imaginative poem, the “*Botanic Garden* :”—

“ Two gentle shepherds, and their sister-wives,
With thee, ANTHOXA ! lead ambrosial lives ;
Where the wide heath in purple pride extends,
And scatter'd furze its golden lustre blends,
Closed in a green recess, unenvi'd lot !
The blue smoke rises from their turf-built cot.
Bosom'd in fragrance blush their infant train,
Eye the warm sun, or drink the silver rain.”

Bot. Garden, Part II. Canto I. l. 85–92.

26. PHAL'ARIS, L. CANARY GRASS.

[Greek, *Phalos*, shining ; alluding to the shining florets, or paleæ.]

Spikelets in a dense or spiked panicle, 3-flowered, but the *two lower* (or

lateral) florets mere neutral *rudiments* at the base of the perfect one. *Glumes* nearly equal, boat-shaped and often winged-keeled, exceeding the florets. *Fertile floret* flattish, of two shining awnless *paleæ* which at



FIG. 270 Sweet-scented Vernal Grass (*Anthoxanthum odoratum*). See Fig. 249.

length become coriaceous, closely investing the free smooth *grain*. *Leaves* broad and flat.

1. *P. arundina'cea*, *L.* Panicle oblong, with the spikelets more or less clustered and somewhat secund on the branches; glumes keeled, wingless; neutral, rudiments hairy.

REED-LIKE PHALARIS. Reed Canary Grass.



FIG. 271. Reed Canary Grass (*Phalaris arundinacea*). 272. A spikelet. 273. A spikelet with the glumes removed; the central fertile flower with two minute abortive ones at its base

Perennial. Culm 3–5 feet high. *Leaves* 5–12 inches long, lance-linear, keeled, deep green; *sheaths* smooth; *ligule* ovate, obtuse. *Panicle* erect, finally a little spreading, glaucous. *Glumes* acute or acuminate with flattened tips, whitish with 3 green nerves. *Paleæ* pilose with appressed hairs. *Grain* ovate, dark brown.

Swampy places and borders of rivulets: common. June–July.

Obs. This fine-looking deep green grass frequently arrests the attention on account of its luxuriant growth and promising appearance; but it is of little or no agricultural value. When cut early and made into hay, cattle, it is said, will eat it if they can get nothing better. A variety, with the leaves striped with white, is known in gardens as the Striped or Ribbon Grass. When this variety is allowed to grow in wet situations it loses its peculiarity.

2. *P. CANARIEN'SIS, L.* Panicle spike-like, oval; glumes wing-keeled; neutral rudiments smooth.

CANARY PHALARIS. Canary Grass.

Annual. Culm 1–2 feet high, smooth. *Leaves* pale green and glaucous; the *sheaths* somewhat inflated. *Glumes* nearly twice as long as the *paleæ*, yellowish-green.

Waste places and in cultivation. Native of Europe. July–September.

Obs. This is sometimes cultivated for the seed which is the favorite food of Canary Birds; it is also naturalized to some extent and is frequently seen in waste places.

27. PAS'PALUM, L. PASPALUM.

[Greek, *Paspalos*; said to be an ancient name for Millet.]

Spikelets racemose-spiked, usually in 2 rows, on one side of a flattened continuous rachis, jointed with their very short pedicels, plano-convex and nearly orbicular. *Glume* and *empty palea* few-nerved. *Perennials* with erect smoothish culms and single, digitate or racemed spikes.

1. *P. seta'ceum, Mx.* Culm slender; leaves hairy; spike mostly solitary on a long terminal peduncle.

SETACEOUS PASPALUM.

Culm 1–2 feet high, setaceously slender, often purplish below and somewhat hairy. *Leaves* 2–6 inches long, hairy on both sides; *sheaths* smooth, pilose at throat. *Spike* 2–4 inches in length, very slender,—often with another on a short peduncle from the same sheath, sometimes others from the lower sheaths.

Sandy fields and road-sides: throughout the United States. August.

Obs. This grass, together with *Panicum sanguinale, L.*, is said by Dr. Short to supplant and take the place of the Kentucky Blue Grass, at the West, in all exposed and sunburnt situations, after midsummer. *

28. PAN'ICUM, L. PANIC GRASS.

[Supposed from the Latin, *Panis*, bread; which some species afford.]

Spikelets panicled or racemose, sometimes spiked. *Glumes* unequal; the lower one short or minute, sometimes wanting. Lower floret neutral or staminate, rarely awned, mostly consisting of a single *palea* which resembles the upper glume. Upper floret perfect, coriaceous, awnless, en-

closing the free and grooveless grain. Stamens 3. Stigmas plumose, usually purple. The species here enumerated are all annual.

* *Spikelets crowded 2 – 3 together in simple one-sided digitate-fascicled spikes : neutral floret of a single palea : lower glume minute or wanting.*

1. *P. sanguinalis*, L. Spikes 4 – 15 ; upper glume half the length of the flower ; the lower one small.

BLOODY (OR PURPLE) PANICUM. Crab Grass. Finger Grass.

Culm decumbent, 1–2 feet long, somewhat branching from the sheaths, geniculate, glabrous, radicating at the lower nodes. *Leaves* 1 or 2 – 6 or 8 inches long, softly pilose ; *sheaths* strigosely hairy, sometimes smooth ; *ligule* short, truncate, or ovate and acute, white or often tinged with purple. *Spikes* 2 or 3 – 6 inches in length, often in 2 fascicles or verticils a little distant from each other, becoming purple ; *rachis* flat, flexuose, scabrous on the margin. *Spikelets* in pairs, appressed, in 2 rows on the outer or under side of the rachis, on short pedicels,—the lower ones subsessile.

Gardens and cultivated grounds : throughout the United States. *Fl.* July – September. *Fr.* August – October.

Obs. In the middle States, this is a troublesome Grass in Gardens, in the latter part of summer ; and is frequent, also, in Indian Corn-fields,—but not difficult to be kept in reasonable subjection, by the early and free use of the “cultivator.” Cattle will eat it,—but do not appear to be particularly fond of it : and indeed it is generally choked out of good pastures, by the prevalence of more acceptable grasses. It is said to be a serious pest, in the cultivated grounds of the Southern planters. Mr. ELLIOTT—than whom there can be no better authority—has the following remarks on this plant :—“Grows everywhere on lands not inundated. Well known to planters under the name of Crab or Crop grass. It is the most troublesome grass our planters have to encounter in high ground culture, and though an annual, it is the best grass for hay at present known in our low country.”

2. *P. glabrum*, Gaudin. Spikes 2 – 6, widely diverging ; upper glume equalling the floret ; the lower almost wanting.

SMOOTH PANICUM. Smooth Crab Grass.

Culm 6–12 inches long, often closely prostrate. *Leaves* 1–3 inches in length ; *sheaths* smooth, a little pilose at the throat. *Spikes* 1–3 inches long, seldom more than 3 in number ; *spikelets* greenish-purple.

Cultivated grounds and waste places. Native of Europe. August – September.

Obs. Naturalized in cultivated fields and lots, but not so troublesome as the preceding. A very slender, smooth species with erect spikes (*P. filiforme*, L.) belongs to this section ; it is often abundant in sandy pastures, but it is not very important in any respect.

** *Spikelets scattered in large capillary panicles, awnless : neutral floret of a single palea.*

3. *P. capillare*, L. Sheaths very hirsute ; panicle large, capillary, loose, finally expanding ; spikelets lanceolate, acuminate, on long scabrous peduncles.

CAPILLARY OR HAIR-LIKE PANICUM. Old-witch Grass.

Root annual. *Culm* assurgent or erect, usually 1–2 feet (occasionally only a few inches) high, sometimes branching. *Leaves* 3–8 or 10 inches long, lance-linear, rather broad, acuminate, nerved, hairy; *sheaths* sulcate-striate, very hirsute with spreading, whitish bristly hairs; *ligule* short, fringed or beard-like. *Panicle* large and pyramidal; branches numerous, subdivided, very slender, straight,—at first erect, then spreading, finally divaricate. *Spikelets* small, often purple. *Abortive floret* without a superior palea. *Perfect floret* much shorter than the upper glume, lance-oblong, plano-convex, smooth and shining.

Sandy pastures, cultivated grounds: throughout the United States. *Fl.* August. *Fr.* September.

Obs. This worthless species flourishes most in a light sandy soil; but it is usually more or less abundant in all Indian Corn-fields, in the latter part of summer. In autumn the dry culms break off, and the light divaricate panicles are rolled over the fields, by the winds, until they accumulate in great quantities along the fences and hedges.

*** *Spikelets imbricate-spiked on paniculate branches: lower palea of sterile floret awned or mucronate.*

4. *P. Crus-gal'li*, L. Culms stout, smooth; spikes alternate; glumes ovate, abruptly pointed; lower palea of sterile flower with an awn of variable length.

COCK'S-FOOT PANICUM. Barn-yard Grass.

Root annual. *Culm* 2–5 feet high, rather coarse, smooth. *Leaves* 9–15 inches long, lance-linear, broadish, flat, nerved, serrulate on the margin; *sheaths* rather loose, compressed, striate, smooth; *ligule* none. *Spikes* sub-paniculate,—the spikelets crowded in dense spike-form, compound racemes on the branches. *Spikelets* ovoid, plano-convex, echinate, awned or sometimes awnless; *lower glume* short, ovate, acute, 3-nerved,—the upper one as long as the perfect floret, ovate, acuminate, 5-nerved, with bristles on the nerves. *Neutral floret* with 2 *paleæ*,—the lower one ovate, flat, with a scabrous awn or long acumination, 5-nerved—one of the nerves central, scabrous, the others marginal, in approximated pairs, presenting a double row of cartilaginous bristles,—the upper palea ovate, acute, thin and membranaceous, nearly as long as the perfect floret. *Perfect floret* plano-convex, acuminate, the *paleæ* firm, smooth and shining. *Grain* compressed, orbicular, white or ash-colored.

Moist grounds, meadows, drains of barn-yards, &c.: introduced? *Fl.* August. *Fr.* September.

Obs. Kunth gives this as an inhabitant of the four quarters of the globe; but I suspect it is a naturalized foreigner. There is a variety in which the sheaths are hispid, and another in which the floral coverings are awnless. It is apt to abound along the drains of crude liquid flowing from barn-yards,—and in spots which are usually designated as “wet and sour.” Though usually regarded as a mere weed, and worthless, yet we have the authority of Mr. Flint for the remark that “some experiments have been made to cultivate this common species in the place of millet, to cut for green fodder. It is relished by stock and is very succulent and nutritive.” This vast genus (containing upwards of 400 species,—a considerable number of which are indigenous, or found in our country) is remarkable for the little value, or interest, which it possesses in an agricultural point of view. With the exception of *P. miliaceum*, L.—and perhaps one or two other oriental species, which produce a kind

of Millet—the whole multitudinous group are regarded as little better than mere weeds ;—though none of them, so far as I know, are particularly obnoxious or difficult to expel by judicious culture. Those here described, are inserted merely as samples of a numerous and somewhat variant family.

29. SETA'RIA, Beauv. BRISTLY FOX-TAIL GRASS.

[Latin, *Seta*, a bristle ; from the involucre-like bristle of the spikelets.]

Spikelets as in *Panicum*, awnless, but with the short *peduncles* produced beyond them into solitary or clustered *bristles* resembling awns. *Inflorescence* a dense *spiked panicle* or apparently a cylindrical *spike*. *Annuals*: introduced from Europe, and are all naturalized weeds, except the last, which is occasionally cultivated.

1. *S. glau'ca*, Beauv. Spike cylindric, tawny yellow ; bristles 6–10 in a cluster, much longer than the spikelets ; *paleæ* of the perfect floret transversely rugose.

GLAUCOUS SETARIA. Fox-tail Grass.

Root annual. *Culm* 2–3 feet high, sometimes branching, often several from the same root, smooth. *Leaves* 6–12 or 15 inches long, somewhat glaucous, lance-linear, keeled, slightly scabrous, with a few long slender hairs at the base ; *sheaths* striate, smooth ; *ligule* short, fringed or beard-like. *Spike* 2–4 inches long, rather slender and quite cylindrical ; *rachis* pubescent. *Bristles* scabrous upwards, becoming tawny or orange-yellow. *Staminate floret* sometimes wholly abortive or neutral. *Perfect floret* plano-convex,—the *paleæ* very firm and traversed by horizontal undulate wrinkles.

Cultivated grounds ; stubble fields, &c.: introduced. Native of India and Continental Europe. *Fl.* August. *Fr.* September.

Obs. This usually makes its appearance, in abundance, among the stubble after a wheat crop,—and is often seen in pastures, orchards, &c., when not kept down by the promotion of a more valuable growth. Cattle refuse the herbage, if better can be had ; and the plant is altogether worthless,—except that poultry (especially turkeys) are fond of stripping the spikes of their seeds, in the latter part of summer.

2. *S. vir'idis*, Beauv. Spike green, sub-cylindrical or oval-oblong, more or less compound ; bristles few in a cluster, much longer than the spikelets ; *paleæ* of the perfect floret longitudinally striate, punctate.

GREEN SETARIA. Green Fox-tail. Bottle Grass.

Root annual. *Culm* 1–2 or 3 feet high, branching near the base, rather slender. *Leaves* 3–6 or 8 inches long, lance-linear, flat, somewhat scabrous, minutely serrulate on the margin ; *sheaths* striate, smooth, pilose on the margin ; *ligule* fringed or beard-like. *Spike* 1–3 inches long, somewhat compound or a little enlarged in the middle, often nearly cylindric ; *rachis* hirsute with short hairs. *Bristles* scabrous upwards, green. *Sterile floret* usually wholly abortive or neutral,—the *upper palea* very small. *Paleæ* of the *perfect floret* smooth, punctulate, striate longitudinally, with a slight transverse rugosity perceptible under a lens.

Cultivated grounds, pastures, &c.: introduced. Native of Southern Europe. *Fl.* July–August. *Fr.* August–September.

Obs. This species is also naturalized to a considerable extent, and is



about as worthless as the preceding,—but is not regarded as a serious nuisance.

3. *S. ITALICA*, Beauv. Var. *Germanica*, Kunth. Spike compound,

FIG. 274. Fox-tail Grass (*Setaria glauca*).

ovoid-oblong, yellowish-green; bristles 4–8 in a cluster, about as long as the spikelets; paleæ of the perfect floret smooth, striately punctate.

ITALIAN SETARIA. Millet. Bengal Grass.

Root annual. *Culm* 2–4 or 5 feet high. *Leaves* 6–12 and 18 inches long, lance-linear, rather broad, flat, serrulate on the margin; *sheaths* striate, pubescent on the margin; *ligule* beard-like. *Spike* compound (or rather a densely contracted *panicle*), 3–6 inches long, ovoid-oblong or sub-cylindric; *rachis* densely hirsute with long hairs. *Bristles* sometimes longer than the spikelets, yellowish. *Sterile floret* wholly abortive, or neutral,—the *upper palea* very minute. *paleæ* of the *perfect floret* smooth, minutely striate-punctate.

Fields; cultivated as a fallow crop. Native of Europe and India. *Fl.* July. *Fr.* Aug.

Obs. Some years ago, the culture of this plant was introduced into Pennsylvania, and excited considerable interest, for a time, among the farmers,—as affording valuable fodder, when the usual hay-crop was likely to be deficient. It was soon found, however, not to be as valuable as the usual fallow crop (of Oats or Barley), of which it occupied the place; and was, moreover, remarkably liable to damage from rain. The cultivation, therefore, soon declined,—and is now generally abandoned. There is another species (*S. verticillata*, Beauv.,—with the spike composed of interrupted verticils of spikelets, and the involucre of retrorsely scabrous bristles, in pairs,) which is becoming something of a nuisance, about gardens, in many places; but it seems scarcely, as yet, entitled to a more particular notice here.

30. CEN'CHRUS, L. BUR GRASS

[Greek, *Kenchros*; the ancient name of Millet.]

Spikelets as in *Panicum*, awnless, but enclosed (1–5 together) in a globular bristly or spinose *involucre*, which becomes coriaceous, forming a deciduous *bur* in fruit. *Involucres* sessile in a terminal *spike*. *Styles* united below.

1. *C. tribuloides*, L. Involucre subglobose, pubescent, spinosely muricate, split on one side.

TRIBULUS-LIKE CENCHRUS. Bur Grass. Hedge-hog Grass.

Root annual. *Culm* 1–2 feet long, usually oblique or procumbent, geniculate, branching, smooth. *Leaves* 3–6 or 8 inches long, lance-linear, acuminate, slightly scabrous on the margin; *sheaths* loose, smooth; *ligule* beard-like. *Raceme* terminal, of 6–12 or 14 alternate involucre heads or clusters; *rachis* angular, flexuose, slightly scabrous. *Involucre* urceolate or subglobose, laciniate, usually split to the base on one side, hairy, armed externally with rigid subulate scabrous spines, villous within, embracing 1, 2, or 3 spikelets. *Sterile floret* mostly staminate. Sandy fields. *Fl.* Aug. *Fr.* Sept.

Obs. The plant is very abundant in sandy districts along the coast and around the great Lakes,—and has found its way to some of the slaty hills of Pennsylvania. It is altogether a worthless grass; and the prickly involucre are a grievous nuisance, wherever it prevails in cul-

tivated grounds, or about houses. It ought to be most carefully and thoroughly extirpated, on its first appearance in any agricultural region.

31. TRIP'SACUM, L. GAMA GRASS.

[Greek, *tribo*, to rub ; perhaps in allusion to its polished fertile spikes.]

Spikelets monœcious, in terminal and subterminal *jointed spikes* which are solitary, or often digitate in twos or threes, *staminate* above and *fertile* below. STAMINATE SPIKELETS in *pairs* on each triangular joint, longer than the joint, collateral, 2-flowered; *glumes* coriaceous, the outer one nerved, the inner one boat-shaped; *paleæ* very thin and membranaceous, awnless; *stamens* 3; *anthers* orange-colored, opening by 2 pores at summit. PISTILLATE SPIKELETS single, 2-flowered (the *lower* one neutral), deeply imbedded in each oblong joint of the cartilaginous thickened *rachis*, and occupying a boat-shaped cavity which is closed by the polished cartilaginous ovate *outer glume*; *inner glume* much thinner, boat-shaped; *paleæ* very thin, hyaline and closely packed together. *Style* long; *stigmas* very long, plumose, dark-purple. *Grain* ovoid, free. *Perennials* with cæspitose tall branching *culms* which are hard, smooth and solid; *leaves* very long, sublinear, acuminate; *spikes* separating at the articulations spontaneously, at maturity.

1. *T. dactyloi'des*, L. Spikes usually 2–3, aggregated or digitate sometimes solitary,—the upper half staminate, the lower pistillate.

FINGER-LIKE TRIPSACUM. Gama Grass. Sesame Grass.

Culms 3 or 4–6 feet high, hard and glabrous, solid with pith,—the internodes broadly channelled on alternate sides; *nodes* smooth, with a dark-brown contracted ring at the base of the sheaths. *Leaves* 1 or 2–4 feet long, and half an inch to an inch or more in width, lance-linear, keeled, smooth beneath, roughish on the upper surface, serrulate on the margin, contracted and sparingly pilose at base; *sheaths* nerved, glabrous; *ligule* very short, ciliate. *Spikes* 4–6 or 8 inches long, not unfrequently single; **when solitary**, the pistillate portion of the spike is terete,—when in pairs, semi-terete as if split down,—and when ternate the spikes are somewhat triquetrous. *Caryopsis* ovoid, smooth,—the *pericarp* thin and tender.

Moist meadows, banks of streams, &c. : Middle and Western States. *Fl.* July. *Fr.* September.

Obs. This stout and remarkable Grass is not very common on the Atlantic slope of our continent; but it is said to be abundant in the valley of the Mississippi. Some years ago it was highly extolled, by a few western correspondents of our Agricultural Journals, as an article of fodder for stock; but I have not heard much of it, latterly. The leaves and young culms may probably answer a good purpose—where better materials are scarce; but any one who will examine the coarse hard stems of the full-grown or mature plant, may soon satisfy himself that it can never supersede the valuable grasses, or the good hay, now in use,—nor compete, in any respect, with common Indian-corn fodder.

32. ZE'A, L. INDIAN CORN.

[Greek *zao*, to live ; from the sustenance it affords to animal life.

STAMINATE SPIKELETS in terminal, fascicled, *spicate racemes*, 2-flowered ; *glumes* herbaceous, pubescent ; *paleæ* membranaceous, awnless ; *stamens*

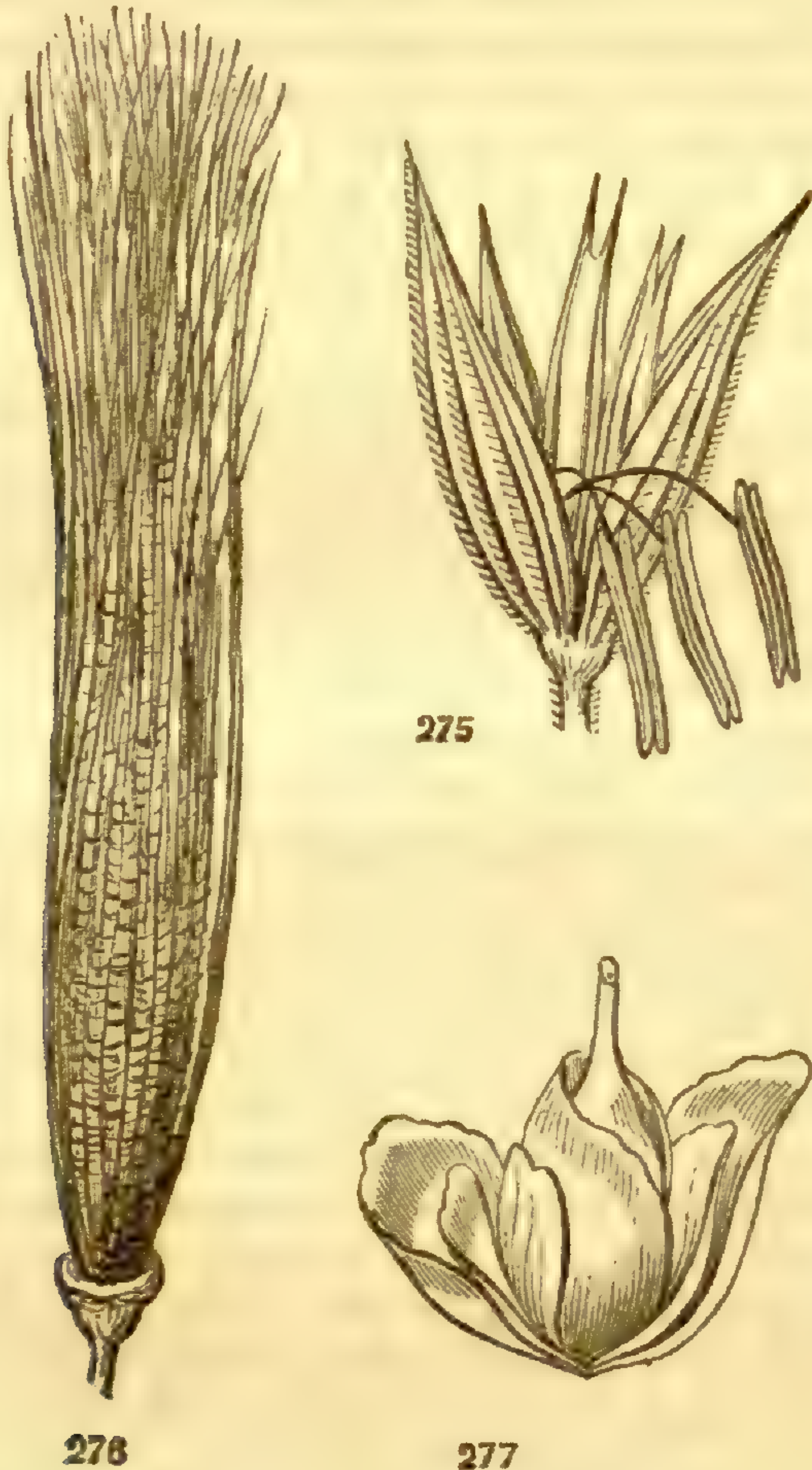


FIG. 275. A staminate spikelet, from the tassel of Indian Corn (*Zea Mays*). 276. The pistillate spike or ear, with the involucre or husk removed ; the long styles of the numerous crowded spikelets forming the silk. 277. A separate spikelet, showing the fertile and sterile floret enclosed in the glumes or chaff.

3; *anthers* linear, erect; *scales* 2, collateral, fleshy, glabrous. **PISTILLATE SPIKELETS** sessile, 2-flowered (the lower one abortive), in dense *continuous spikes*, which terminate short, nodose, axillary branches,—the spikes enveloped by *sheaths* of abortive leaves, called *husks*; *glumes* fleshy-membranaceous, very broad, ciliate,—the lower one emarginately 2-lobed; *paleæ* fleshy-membranaceous,—the abortive floret with 2 *paleæ*. *Ovary* roundish ovoid; *style* capillary, very long, exserted from the envelopes of the spike, pubescent at the summit, and mostly bifid (*stigmas*?) *Grain* usually crowded and then compressed, cuneate or roundish-kidney-shaped, with a shallow groove on the upper side containing the embryo,—the base imbedded in the persistent *glumes* and *paleæ*. *Annual*: *culm* stout, solid with pith; *pistillate spikelets* in 8–12 longitudinal rows on the thick sub-cylindric *rachis*, the *rows* always in approximated pairs, before the spaces are filled by their growth; *spikes* (or *ears*) 1–3 or 4 (rarely more—usually 2) on a *culm*.

1. Z. MAYS, L. Leaves flat, linear-lanceolate, acuminate, with a broad midrib channelled above.

Indian Corn. Maize.

Culm 4–15 feet high, and about an inch or an inch and a half in diameter, simple (often producing branches or suckers, at base), nodose, semi-terete, or with a broad shallow channel, on alternate sides, between the nodes. *Leaves* 2–3 feet long, and 2–4 inches wide, pubescent above, smooth beneath; *sheaths* smooth, pubescent along the margins; *ligules* short.

Cultivated. Native of South America. *Fl.* July. *Fr.* September.

Obs. Culture has produced several varieties of this plant,—with the grains yellow, white, or sometimes dark purple. In the North, it is much smaller than in the middle and South-western States. There is, also, a remarkable variety—frequent, I believe, in the South-west—in which a kind of husk, or involucre, is developed around every grain, or spikelet, on the receptacle. The Indian Corn is one of the most interesting of the Gramineæ, or Grass Family,—rivalling the Sugar Cane and the Rice, in intrinsic value, and, in the more favorable districts, ranking next in importance to Wheat itself. In a botanical light, the Corn Plant is an interesting one. The staminate flowers, commonly called the *tassel*, are arranged at the summit of the plant where their pollen may fall upon the pistillate spikes, or *ears*, below; these are dense spikes covered with sheaths of abortive leaves, the *husks*, which often have their blade more or less developed. The *silk* of the ear is the elongated pistils, one of which proceeds from each ovary or *kernel*. The *cob* is the thick rachis, and the chaff which covers it the *glumes* and *paleæ*. From the lower nodes or joints aerial roots are often thrown out, imitating in an humble way the celebrated Banyan-tree. The juice of the stem, before the grain is perfected, contains a considerable amount of saccharine matter, and sugar has been obtained from it. The young ears—especially in the varieties known as sweet corn—have much sugar, which is changed into starch as the grain ripens. *

33. SACCHA'RUM, L. SUGAR CANE.

[Latinized from the Greek, *Sacchar*; originally from the Arabic, *Soukar*, Sugar.]

Spikelets in pairs—one of them pedicellate, the other sessile—each 2-flowered, with a tuft of long silky hairs at base; the lower floret neuter, with a single palea,—the upper one perfect. *Glumes* 2, nearly equal, awnless. *Paleæ* 3 (counting that of the neutral floret), minute, unequal, awnless, hyaline. *Scales* 2, obsoletely 2–3-lobed at apex, sometimes connate in a tube. *Stamens* 1–3. *Ovary* sessile, glabrous; *styles* 2, terminal, elongated; *stigmas* plumose,—the hairs simple, denticulate. *Grain* free?—*Gigantic tropical grasses, with large silky panicles.*

1. *S. OFFICINA'RUM*, L. Leaves flat; panicle large and expanding; spikelets racemose on the slender branches; florets triandrous; glumes obsoletely 1-nerved, or keeled, invested with long silky hairs at base.

OFFICIAL SACCHARUM. Sugar Cane.

Fr. Canne à Sucre. *Germ.* Aechtes Zucker-rohr. *Span.* Caña de Azucar.

Root perennial (a nodose *rhizoma*). *Culm* 8–15 or 20 feet high, and 1–2 inches in diameter, with numerous nodes, and solid with pith. *Leaves* linear-lanceolate, large (something resembling those of Indian Corn). *Panicle* a foot or more in length, loosely branched, the branches numerous, filiform, 4–6 inches long, remarkably plumose, or pubescent with verticils or tufts of long white silky hairs at the base of the racemose spikelets.

Cultivated in Louisiana and other States in the extreme South of the Union. Native of Asia. *Fl.* *Fr.*

Obs. The Sugar Cane is rarely permitted to flower, under cultivation, being propagated by sections of the culm. The value and importance of this noble Grass, in the domestic economy and commerce of the civilized world, are too well known to require comment. Not having the advantage of an acquaintance with the living plant, and its culture, my descriptive details and remarks are necessarily very imperfect. Some interesting notices may be found in "Rees' Cyclopædia," *Art.* Sugar; and in the "Farmer's Encyclopædia."

34. ANDROPO'GON, L. BEARD GRASS.

[Greek; literally *Man's-beard*,—in allusion to the hairy spikets.]

Spikelets 2-flowered, in pairs on each joint of the slender *rachis*, spiked or racemose; one of the spikelets pedicellate and sterile, often a mere rudiment: the other sessile, with the lower floret neutral and of a single palea, the upper one perfect, of two thin hyaline paleæ, which are shorter than the subcoriaceous glumes, the lower awned from the tip. *Stamens* 1–3. *Grain* free. *Perennials* with rigid culms, smooth nodes, and lateral and terminal, often clustered or digitate spikes; the *rachis* hairy or plumose-bearded.

* *Spikes* solitary at the apex of the culm and branches.

1. *A. scopa'rius*, Mx. Culm paniculately branched above,—the

branches somewhat fasciculate, erect, elongated, slender and purplish; sheaths villous; spikes on long peduncles; the sterile ones neuter, awned.

BROOM ANDROPOGON. Indian Grass. Purple Wood-grass.

Culm 3-4 feet high, rather slender, smooth, somewhat compressed, sulcate on alternate sides of the internodes: *nodes* smooth; *branches* long, slender, in lateral fascicles, or sometimes in pairs, often subdivided. *Leaves* 4-8 or 12 inches long, lance-linear, acute-scabrous, a little hairy and somewhat glaucous; *sheaths* striate, roughish; *ligule* truncate. *Spikes* about 2 inches long; *rachis* compressed or plano-convex, pilose at the edges. *Spikelets* distichously arranged; *abortive spikelet* minute, subulate, on a linear plumose pedicel which is nearly as long as the perfect spikelet,—the *floret* neuter; *perfect spikelet* sessile; *glumes* lance-linear, much acuminate,—the lower one bifid at apex; *paleæ* nearly equal, ciliate,—the lower ? one deeply bifid, with a twisted awn between the segments.

Old fields, sterile banks, and road-sides, throughout the United States. *Fl.* August. *Fr.* September.

Obs. This, and the other native species, are remarkably worthless grasses,—and are apt to abound in poor old neglected fields. Where they prevail, no further evidence is required to demonstrate the unprofitable condition of the land, or the miserable management of the occupant.

* * *Spikes digitate, at the apex of the culm or branches.*

2. A. furca'tus, Muhl. Spikes digitate, generally in threes or fours; rachis hairy; the sterile floret staminate, awnless.

FORKED ANDROPOGON. Finger-spiked Indian Grass.

Culm about 4 feet high, smooth, terete below, semi-terete above, often branching; *nodes* smooth. *Leaves* 4-8 or 12 inches long, lance-linear, nerved, smoothish, scabrous on the margin, pilose at base; *sheaths* striate, smooth; *ligule* obtuse, sometimes ovate, fringed. *Spikes* 2-3 inches long, usually in threes or fours (sometimes 5-6) frequently purple; *rachis* semi-terete, pilose on the angles; *abortive spikelet* on a clavate, plumose pedicel: *perfect spikelet* sessile. Slaty hills, and sterile low grounds. *Fl.* Aug. *Fr.* Sept.

Obs. This is one of the native species which is very worthless,—and very frequent on poor, neglected, badly managed farms. The species of *Andropogon* here given, are the most common and obtrusive ones, in our poor lands,—at least in Pennsylvania. There are a few others,—particularly one with the spikes conjugate, in fastigate bushy panicles (*A. macrourus, Mx.*),—which is not unfrequent in wet, swampy meadows; but, though they are all equally worthless, these are scarcely of sufficient importance to require further notice in this work.

35. SOR'GHUM, Pers. BROOM CORN. SORGHUM.

[The ancient name of a cultivated species.]

Spikelets 2-3 together on the branches of a mostly loose and open panicle,—the lateral ones sterile, or often mere rudiments,—the *middle* (or *terminal*) one only fertile. *Glumes* coriaceous, sometimes awnless. *Stamens* 3. For the rest as in *Andropogon*.

* *Culms slender, fistular.*

1. S. nu'tans, Gray. Leaves lance-linear; ligule elongated, truncate; panicle narrowly oblong; fertile spikes russet-brown.

NODDING SORGHUM. Wood Grass. Oat-like Indian Grass.

Root perennial. *Culm* 3-5 feet high, simple, terete, glabrous; *nodes* bearded with white appressed hairs. *Leaves* 6-18 inches long, lance-linear, rough, serrulate on the margin; *sheaths* nerved, smooth; *ligule* elongated, truncate, bordered by a lanceolate extension of the margins of the sheath. *Panicle* 6-9 inches in length,—the ultimate branches or pedicels of the upper spikelets, plumosely hairy. *Abortive spikelet* pedicellate, often a mere awn-like plumose rudiment. *Glumes* of the *perfect spikelet* lanceolate, indurated, of a light russet brown color,—the lower or outer one hairy, embracing the upper one, which is smooth and rather longer. *Palea* thin and membranaceous,—the lower ? one bifid, awned below the division; *awn* contorted, bent obliquely.

Sterile old fields : throughout the United States. *Fl.* August. *Fr.* September.

2. *S. SACCHARATUM*, *Pers.* Leaves linear-lanceolate; ligule short, ciliate; panicle with long verticillate branches, loosely expanding.

SUGAR SORGHUM. Broom CORN.

Root annual. *Culm* 6-8 or 9 feet high, and half an inch to an inch in diameter, smooth; *nodes* tumid, with a ring of short appressed hairs at the base of the sheaths. *Leaves* about two feet long, and 2-3 inches wide, linear-lanceolate, acuminate, keeled, smooth, densely pubescent at base adjoining the ligule; *sheaths* smooth, *ligule* short, ciliate. *Panicle* 1-2 feet long,—the *branches* nearly simple, long, flexuose, scabrous with short hairs. *Spikelets* mostly in pairs, one of which is abortive (the terminal ones in threes, two being abortive), and these *pairs* in racemose clusters of threes or fours, near the extremities of the branches. Upper ? or inner *palea* of the fertile spikelets with a purplish flexuose *awn*, about twice as long as the spikelet.

Gardens and fields : cultivated. Native of India and Arabia. *Fl.* August. *Fr.* Oct.

Obs. This species is cultivated for the panicles, of which brooms and brushes are made. It is said that DR. FRANKLIN first introduced Broom Corn into our country; he chanced to see a Corn Whisk in the possession of a lady, and while examining it, as a novelty, he spied a grain of it still attached to the stalk. This he took and planted.

3. *S. VULGARIS*, *Pers.* Panicle erect or somewhat contracted; glumes of the fertile panicle pubescent.

COMMON SORGHUM. Indian Millet. Durra.

Annual. *Culm* 5-9 feet high; *nodes* pubescent. *Leaves* 6-9 inches long. *Panicle* 6-12 inches in length.

Cultivated. Native of India. *Fl.* August. *Fr.* October.

4. *S. CERNUUM*, *Willd.* Panicle densely contracted, oval, mostly rigidly recurved or nodding; glumes villous, fringed.

DROOPING SORGHUM. Guinea Corn.

Annual. *Culm* 6-8 feet high; *lower nodes* emitting verticillate radicles. *Leaves* 12-18 inches long. *Panicle* 4-6 inches long; *florets* villous, fringed, scarcely awned.

Cultivated. Native of India. *Fl.* August. *Fr.* October.

Obs. The genus *Sorghum* has acquired a considerable importance within a few years, on account of the introduction of some species or varieties as a sugar-producing plant, under the names of Chinese Sugar Cane, Sorghum, Sorgho, Imphee, &c. The true botanical character of the Sugar Plant does not seem to be settled,—it being referred by some to *S. saccharatum*—by others to *S. bicolor*,—and by some writers it is spoken of as *Holcus saccharatus*. It is probably a variety of *S. VULGARE*, and was introduced into Pennsylvania forty years ago under the name of "Chocolate Corn;" and the seeds were roasted by the farmers' families,

as a substitute for coffee. The plant is very rich in saccharine matter, and affords an excellent syrup ; but the sugar is uncrystallizable, and as yet no process has been discovered by means of which sugar can be produced from it in any quantity. Those who are interested in this matter will find a full account of all that is at present known concerning the culture of this grass, whether for syrup making or as a food for stock, in a work called "Sorgho and Imphee," by HENRY S. OLCOTT, published by A. O. MOORE, New York.

GLOSSARY

OF THE

PRINCIPAL BOTANICAL TERMS USED IN THIS WORK

■ The reader will bear in mind, that where *compound* descriptive terms are employed in this work, the *last member* of the compound word is intended to give the *predominant character*—and that the word or syllable *prefixed*, merely indicates a *modification* of that character: as, for example,—“*ovate-lanceolate*” signifies *lanceolate, but inclining somewhat to ovate*; while “*lance-ovate*” means *ovate with something of the lanceolate form*, &c. So of colors: “*yellowish-green*,” “*bluish-green*,” &c. signify that *green* is the prevailing hue,—but that it is *tinged* with a shade of *yellow, blue*, &c. Terms indicative of the *size* of any organ, or portion of plant—as “*large*,” “*small*,” or “*middle-sized*”—are, of course, relative,—and have reference to the usual or average size of such parts, or organs, in other species of the same genus, or family.

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| <p>A; at the commencement of a word, signifies the absence of some part, as : <i>apetalous</i>, destitute of petals. When the word commences with a vowel <i>an</i> is prefixed.</p> <p>Abnormal; different from the regular or usual structure.</p> <p>Abortion; an imperfect development of any organ.</p> <p>Abortive; not arriving at perfection; producing no fruit.</p> <p>Abrupt; not gradual; sudden.</p> <p>Abruptly acuminate; suddenly narrowed to an acumination.</p> <p>Abruptly pinnate. See <i>Eren-pinnate</i>.</p> <p>Acaulescent; apparently stemless.</p> <p>Accessory; additional, or supernumerary.</p> <p>Accumbent cotyledons; having the radicle applied to the cleft, or recurved along the edges of the cotyledons (represented by this sign, o=),—as in some Cruciferous plants.</p> <p>Acerose; linear and needle-like,—as <i>Juniper leaves</i>, &c.</p> <p>Achenium. See <i>Akene</i>.</p> <p>Achlamydeous; applied to flowers that have no floral envelopes.</p> <p>Aëcular; needle-shaped.</p> <p>Acotyledonous; destitute of cotyledons, or seed-leaves.</p> <p>Acroëgenous plants. Plants which grow or develop from the apex or summit, only, of the stem.</p> <p>Acrogens. Apex-growers, or <i>acroëgenous</i> plants;—which see.</p> <p>Aculeate; prickly; armed with prickles.</p> <p>Aculeolate; armed with little prickles.</p> <p>Acuminate; ending in a produced tapering point.</p> <p>Acumination. An extended tapering point.</p> | <p>Acute; sharp; ending in an angle, or point: not rounded.</p> <p>Adherent; attached to, or united with another different organ,—as the calyx-tube to the ovary, &c. See <i>coherent</i>.</p> <p>Adnate; adhering laterally; fixed or growing to.</p> <p>Adventitious; happening irregularly; not produced naturally or usually.</p> <p>Equilateral; equal sided: not oblique.</p> <p>Æstivation. The mode in which <i>sepals</i> and <i>petals</i> are arranged in the flower-bud, before they expand.</p> <p>Aftermath. The second growth of the grasses in the same season, after being cut off.</p> <p>Aggregated; crowded, or standing together on the same receptacle.</p> <p>Akene (or <i>Achenium</i>). A 1-seeded fruit with a dry indehiscent pericarp,—often bony or nut-like.</p> <p>Alc. Wings, or membranous expansions.</p> <p>Alate; winged; having a membranous border.</p> <p>Albumen. A deposit of nutritive matter, distinct from the Embryo, found in many <i>seeds</i>,—and sometimes (as in the grasses) constituting their chief bulk.</p> <p>Albuminous seeds; furnished with, or containing albumen.</p> <p>Alternate; not opposite; placed alternately on the axis, or receptacle.</p> <p>Alvéolate; having pits, or cells like a honey-comb.</p> <p>Ament. A slender spike of naked and usually separated flowers, with imbricated scales or bracts.</p> |
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Amorphous; without definite form.

Amplexicaul; embracing or clasping the stem.

Amphitropous ovule; when it is half inverted and stands across the apex of the stalk or funiculus.

Amylaceous; starch-like.

Analogue. A body or organ resembling, substituted for, or equivalent to, another body or organ.

Anastomosing; applied to branching vessels which inosculate, or unite again, like net-work.

Anátropous ovule or seed. Turned; inverted on the funiculus, so that the orifice or apex points towards the placenta.

Ancipital; two-edged; somewhat flattened with opposite edges.

Androecium; a term employed to designate the staminate portion of a flower; the stamens or fertilizing organs in the aggregate.

Androgynous; having staminate and pistillate flowers distinct, but on the same spike, or plant.

Angiospermous; having the seeds contained in a distinct pericarp or seed-vessel.

Angulate; having angles, or corners, mostly of a determinate number.

Annotinous; applied to leaves, &c., which are annual, or renewed every year.

Annual; living or enduring but one year.

Annular; in the form of a ring.

Annulate; having a ring, or belt.

Anomalous; not according to rule or system; forming an exception to usual appearances, or structure.

Anterior; in front,—as that part of a flower next to the bract, or farthest from the axis of inflorescence.

Anther. The knob, or capsule, containing the pollen,—usually supported on a filament.

Anthériférous; bearing Anthers.

Antrorse or antrorsely; pointing forwards, or upwards.

Apétalous; destitute of petals; not having a corolla.

Apex; the summit, upper or outer end.

Aphyllous; destitute of leaves.

Apiculate; tipped with a minute abrupt point.

Appendiculate; having some appendage annexed.

Appressed; pressed to, or lying close against.

Approximate; growing or situated near each other.

Aquatic; growing naturally in water, or in wet places.

Arachnoid; resembling a spider's web.

Arborescent; approaching the size or height of a tree.

Arcuate; curved, or bent like a bow.

Aréola. A small cavity,—as in the base of some akenes.

Arid; dry, as if destitute of sap.

Arillate; having an arillus.

Arillus. An expansion of the *funiculus* or seed stalk, forming a loose (and often fleshy) coating of the seed.

Aristate; awned; having awns, or bristle-like processes.

Armed; having thorns or prickles.

Aromatic; having a spicy flavor or fragrance.

Articulated; jointed; connected by joints, or places of separation.

Articulations. Joints; the places at which articulated members are separable.

Ascending; rising from the ground obliquely.

Assurgent; rising in a curve from a declined base.

Attenuated; tapering gradually until it becomes slender.

Auriculate; having rounded appendages at base, like ears.

Awn. A slender bristle-like process,—common on the chaff of Grasses; sometimes on anthers, &c.

Awned; furnished with awns, or bristle-like appendages.

Awnless; destitute of awns.

Axil. The angle between a leaf and stem, or branch on the upper side.

Axillary; growing in, or proceeding from, the axil.

Axis. A central stem, or peduncle; or, a real or imaginary central line extending from the base to the summit.

Baccate; berried,—becoming fleshy or succulent, like a berry.

Bald akenes; naked at summit; destitute of pappus or crown.

Banner; the broad upper petal of a papilionaceous flower,—called, also, the *Vexillum*.

Barb. A straight process, armed with one or more teeth pointing backwards.

Basal; originating at, or affixed to, the base of another organ.

Beak. A terminal process, like a bird's bill.

Beaked; having, or terminating in, a beak.

Bearded; crested or furnished with parallel hairs; the term is applied, also, to *awned wheat*, &c.

Berry. A pulpy valveless fruit, in which the seeds are imbedded.

Bi, in composition, meaning two or twice; as

Bibracteate; having 2 bracts.

Bibractolate; having 2 small bracts, bractlets, or bracteoles.

Bicarinatè; having 2 keels.

Bicuspidate; ending in 2 sharp points or cusps.

Bidentate; furnished with 2 teeth.

Biennial; living 2 years—in the second of which the flowers and fruit are produced—and then dying.

- Bifurious**; in two series, or opposite rows; pointing in two directions.
- Bifid**; two-cleft, or split into two segments.
- Bifoliate**; having or producing 2 leaves.
- Bifurcate**; forked; ending in two equal branches.
- Bi-gibbous**; having 2 hunches, or gibbous productions.
- Bi-glandular**; having or producing two glands.
- Bi-labiate**; having 2 lips.
- Bilamellate**; having 2 lamellæ, or thin plates.
- Bilocular**; having 2 cells.
- Bipartite**; separable into 2 parts.
- Bipartite**; two-parted.
- Bipinnate leaf**. Twice pinnate; the common petiole having opposite branches, and those branches bearing opposite articulated leaflets.
- Bipinnatifid leaf**. The common petiole bearing opposite pinnatifid segments.
- Bi-rostrate**; having 2 beaks.
- Bi-setose**; having 2 bristles.
- Bisulcate**; having 2 grooves or furrows.
- Biternate leaf**. Twice ternate; the common petiole 3-parted, and each division, or branch, bearing 3 leaflets.
- Bivalved**; having 2 valves.
- Biventricose**; having 2 bellied or distended portions.
- Bloom**. A fine powdery coating on certain fruits, &c., as the plum.
- Border**; the summit or upper spreading part of a calyx or corolla.
- Bowl-shaped**; hemispherical and concave, or hollow, like a bowl.
- Brachiate**; having the branches spreading, opposite and decussate.
- Bract**. A floral leaf; a modified leaf, from the axil of which arises the flower-branch, or peduncle.
- Bracteate**; furnished with bracts, or modified leaves among or near the flowers.
- Bracteoles, or Bractlets**. Small bracts.
- Bractless**; destitute of bracts.
- Branchlets**. Small branches, or subdivisions of branches.
- Bristles**. Stiffish elastic hairs, straight or hooked.
- Bud**. A growing point, or undeveloped axis, covered with the rudiments of leaves.
- Bulb**. A kind of bud, formed of fleshy scales, or coats, and usually under ground—sometimes in the axis of the leaves.
- Bulbiferous**; bearing or producing bulbs.
- Bulbous**; formed of, or like a bulb.
- Bullate leaf**; having bubble-like convexities on the upper surface, with corresponding cavities beneath.
- Caducous**; falling off immediately, or earlier than usual for such organs.
- Calcarate**; spurred; having a process like a horn, or spur,—usually hollow.
- Callous**; firm and gristle-like.
- Callus**. A compact gristle-like tubercle, or substance.
- Calyciform**; shaped like a calyx.
- Calyculate**; having an additional (usually small) outer calyx.
- Calyptra**. The cap or hood (resembling the extinguisher of a candle,) on the fructification of the mosses.
- Calyx**. The flower-cup, or outer (and sometimes the only) covering of a flower, usually green.
- Campánulate**; in the form of a bell.
- Campylotropous ovule**; or seed. Where the ovule curves upon itself, and thus brings the orifice, or apex, near to the funiculus.
- Canaliculate**; channelled or furrowed.
- Candicant**; whitish.
- Canescent**; hoary; clothed with a whitish or grey pubescence.
- Capillaceous, or capillary**; long and fine, or slender, like a hair.
- Capitate**; head-form; growing in a head, or globular mass.
- Capsular**; resembling, or being, a capsule.
- Capsule**. A dry hollow seed vessel,—usually opening by regular valves and definite seams.
- Carina**; keel.
- Carinate**; keeled; having a ridge on the back, like the keel of a boat.
- Carnose**; fleshy; more firm than pulp.
- Carpel**. A little fruit; usually a partial pistil, or constituent portion of a compound fruit.
- Carpophore**. A slender central axis, bearing the carpels,—as in *UMBELLIFERÆ*.
- Cartilaginous**; hard, yet somewhat flexible, like gristle.
- Caruncle**. A fleshy excrescence, sometimes found at the hilum of seeds.
- Caryopsis**. A fruit where the pericarp is very thin, indehiscent, and closely adherent to the surface of the seed,—as in the *Grasses, Cyperaceæ, &c.* See *Utricle*.
- Catkin**; see *Ament*.
- Cauda**. A tail. *Caudate*; having a tail, or tail-like appendage.
- Cauléscent**; having an evident or true stem.
- Cauline**; belonging to, or growing on, the main stem.
- Cellular**; made up of little cells, or cavities, formed of membranaceous sacs.
- Cellular plants**. The lower orders of plants (including the *Mosses*, and those below them), composed exclusively of cellular tissue.
- Centrifugal inflorescence**;—where the central flower of a cyme precedes the others,—i. e. the flowering commences at the centre and extends successively to the circumference.
- Centripetal inflorescence**; where the outer flowers of a corymb, or umbel precede the inner ones,—i. e. the flowers expand, in succession, from the circumference to the centre.
- Cephaloid**; head-shaped.

- Cereal*; pertaining to *Ceres*; belonging to those farinaceous grains, or seeds, of which bread is made,—and over which the goddess *Ceres* was supposed, by the ancients, to preside.
- Cernuous*; nodding; the apex or summit drooping, or turned downwards.
- Cespitose*; having many stems growing from the same root, forming a tuft, or tussock.
- Chaff*. A dry membrane,—usually the small husks, or seed-covers, of the grasses; also the bracts on the *receptacle* of many compound and other aggregate flowers.
- Chaffy*; bearing chaff; also resembling chaff.
- Channels*. Longitudinal grooves; the interstices between the ribs on the fruit of umbelliferous plants.
- Channelled*; grooved or furrowed.
- Character* (in Natural History). The features of objects, or classes of objects, by which they are known, and distinguished from each other.
- Chartaceous*; a texture resembling that of paper.
- Cicatrice*. A scar,—such as that left at the place of articulation, after the fall of a leaf, &c.
- Cilia*. Hairs arranged like eye-lashes, along the margin of the surface.
- Ciliate*; fringed, or edged with parallel hairs like eye-lashes.
- Ciliate-serrate*; having serratures resembling cilia, or short eye lashes.
- Ciliolæ*; diminutive of *cilia*; hairs like miniature eyelashes.
- Cinereous*; of the color of wood ashes.
- Circinate*; with the apex rolled back on itself, like the young fronds of a fern.
- Circumscissid*; cut round transversely, or opening horizontally, like a snuff box.
- Cirrhose*; bearing tendrils, or terminating in a tendril.
- Cirrhus*. A tendril,—which see.
- Class*. One of the higher or primary divisions of plants, or other natural objects, in a systematic arrangement.
- Clavate*; club-shaped; thicker towards the summit, or outer end.
- Clavellate*; in the form of a little club,—i. e. larger at summit.
- Claw* of a petal. The slender tapering portion at base, or below the middle.
- Cleft*; split, or divided, less than half way to the base; sometimes the division itself is called a *cleft*.
- Clypeate*; in the form of an ancient shield or buckler.
- Cotaneous* flowers; appearing at the same time with the leaves.
- Coarctate*; contracted, or crowded into a narrow compass.
- Coccus* (plural *cocci*). A kind of semi-baccate indehiscent carpel.
- Cochleate*; coiled like a snail-shell.
- Coherent*; united with an organ of the same kind,—as stamens coherent with each other, &c. See *adherent*.
- Collateral*; placed side by side; or on the same side of another organ.
- Colored*; of any other color than green.
- Columnella*; a little column.
- Column*. The axis or central pillar of a capsule; or the combined filaments, and style of a Gynandrous or Orchidaceous plant.
- Coma*; a terminal tuft of hair, bracts, &c.
- Commissure*. The line of junction of two bodies,—as the face of the carpels (or *mericarps*), in UMBELLIFERÆ.
- Common* (petiole, peduncle, &c.); belonging to, or sustaining, several similar subordinate parts.
- Comose*; having a tuft or topknot of hairs, bracts, or leaves, at summit or at one end.
- Compact*; condensed or pressed together.
- Complete* flower; having both calyx and corolla.
- Compound*; not simple,—but made up of similar simple parts.
- Compound flower*. An aggregated cluster, or head of syngenesious florets, seated on a common receptacle, and embraced by an involucre, or many leaved common calyx.
- Compound leaf*. Consisting of several leaflets, or laminae, each articulated with the common petiole, and ultimately falling from it.
- Compound Pistil*. Consisting of 2 or more carpels, or simple ovaries, cohering together.
- Compound Umbel*. An Umbel in which each primary peduncle, or ray, bears a small umbel at summit.
- Compressed*; flattened, as if squeezed or pressed.
- Concave*; presenting a hollow or depressed surface.
- Concentric* layers, or circles. Circles of different sizes, or diameters, with a common centre.
- Concrete*; grown together, or united.
- Conduplicate*; doubled lengthwise, or folded together like a sheet of paper, or the leaves of a book.
- Cone*. The woody ament of the Pines.
- Conic, Conical, or Conoid*; having the figure of a cone.
- Confluent*; blended, or running together; forming a junction.
- Congener*. A plant belonging to the same genus: nearly related.
- Conglomerate*; clustered or heaped together.
- Conjugate*; in pairs; coupled.
- Connate-perfoliate* leaves; their bases united round the stem.
- Connate* growing together, or cohering.
- Connective, or Connectivum*. The organ which connects the two cells of an anther,—conspicuous in some of the LABIATÆ.
- Connivent*; the summits meeting, or bending towards each other.

- Constant*; invariable; also never failing, or wanting.
- Contiguous*; so near as to seem to touch.
- Continuous*; without interruption, or articulation.
- Contorted*; twisted; or obliquely overlapping.
- Contracted*; narrowed, or reduced into a smaller compass.
- Contrary* dissepiment. Not parallel, but at right angles, or nearly so, with the valves of the pericarp.
- Convex*; presenting an elevated rounded surface.
- Convolute*; rolled into a cylindrical form.
- Cordate*; heart-shaped, with the sinus or notch at the base.
- Cordate-oblong*; oblong, with a cordate base.
- Coriaceous*; tough and leather like.
- Corm*, or *Cormus*. A fleshy subterraneous stem, of a round or oval figure, and an uniform compact texture, as in *Arum*, or Indian Turnip.
- Corneous*; having the consistence or appearance of horn.
- Corniculate*; having little horns or spurs.
- Cornute*; having appendages like horns.
- Corolla*. The delicate inner covering of the flower, between the calyx and stamens, mostly colored.
- Coroniform*; in the shape of a crown.
- Corrugated*; contracted into wrinkles.
- Cortical*; belonging to the bark.
- Corticate*; clothed with bark.
- Corymb*. A mode of flowering: a kind of raceme, with the lower peduncles elongated so as to form a level top.
- Corymböse*; in the manner of the Corymb.
- Corymbulose*; having the flowers in little corymbs.
- Costate*; ribbed.
- Cotylédons*. The seed-lobes, or first crude leaves of a plant,—formed in the seed; and sometimes becoming green leaves in vegetation.
- Crateriform*; in the form of a cup or bowl, or hemispherical cup.
- Creeping*; running along the ground, and putting forth small roots.
- Crenate*; notched on the edge, with the segments rounded, and not inclining towards either extremity.
- Crenulate*; very finely crenate.
- Crested*; having an appendage resembling a cock's comb.
- Crisp*; curled, or wavy at the edges.
- Cristate*; crested; having a crest.
- Cross*; or *cross-breed*. A hybrid or mule,—produced by the mixing of two nearly allied species.
- Crowded*; thickly set; standing in close order.
- Crown*. A circular series of petaloid appendages at the throat of a corolla; also of chaffy scales at the summit of an akene.
- Crowned*; having appendages resembling a crown.
- Cruciate*, or *cruciform*; having 4 petals arranged in form of a cross.
- Crustaceous*; having a dry brittle snell.
- Cryptogamous* plants. Plants which are destitute of visible genuine flowers.
- Cucullate*; in the form of a cowl; the edges rolled in so as to meet at base, and spreading above,—like a hood thrown back.
- Culm*. The stem of the Grasses, and Cyperaceous plants.
- Cuneate*, or *cuneiform*; wedge-shaped; tapering with straight edges to the base.
- Cupule*. The cup-like involucre of the acorn, &c.
- Cusp*. A stiffish tapering sharp point.
- Cuspidate*; tapering to a straight stiffish sharp point.
- Cuticle*. The outer skin,—usually thin and membranaceous.
- Cyathiform*; top shaped and hollowed at the summit like a cup.
- Cylindric*; long, round and of uniform diameter.
- Cyme*. A kind of panicle, depressed nearly to the form of an umbel,—with the principal peduncles rising from the same centre, but the subdivisions irregular.
- Cymose*; with the flowers in cymes, or approaching that form.
- Cymules*. The reduced cymes, or cymose clusters, of the LABIATÆ; sometimes called *Verticillasters*.
- Decandrous*; having ten distinct stamens.
- Deciduous*; falling off at the usual time, or at the end of the season; more durable than *Caducous*,—which see.
- Declinate*, or *declined*; bent off horizontally; or curved downwards.
- Decomound*; several times compound.
- Decumbent*; leaning upon the ground, with the base only erect.
- Decurrence*. A running or extending down, or backwards.
- Decurrent* leaf. When the two edges are continued down the stem, like wings.
- Decussate*; growing in opposite pairs and alternately crossing each other.
- Definite*; clearly defined, or limited; also of a constant or determinate (and not large) number.
- Deflected*; bent off, or downwards.
- Dehiscent*; gaping or opening naturally by seams, at maturity.
- Deltoid*; triangular in the outline,—like the Greek letter *Delta*.
- Demersed*; growing or being under water.
- Dense*; closely arranged; compact.
- Dentate*; toothed; edged with tooth-like projections.
- Denticulate*; having very small teeth.
- Depauperate*; with a starved or stunted inflorescence; few-flowered.
- Depressed*; flattened vertically, or pressed down at summit.

Depressed-globose; globular, with the base and apex flattened.

Di; in composition, two.

Diadelphous; having the filaments united in 2 parcels,—usually 9 and 1, with a papilionaceous corolla.

Diandrous; having 2 stamens.

Diaphanous; transparent; permitting light to pass through.

Dichotomous flower. Situated in the fork of a dichotomous stem or branch.

Dichotomous; forked; regularly divided and subdivided, in two equal branches.

Declinous; having the stamens and pistils in distinct flowers,—whether on the same or different plants.

Dicotyledonous plants. Where the embryo has 2 lobes, or cotyledons.

Didymous; twin; growing in pairs and more or less united.

Didynamous; having 2 long and 2 shorter stamens, mostly in a bilabiate, ringent, or personate corolla.

Diffuse; spreading widely in a loose irregular manner.

Digitate leaf. Where a simple petiole connects several distinct leaflets, *finger-like*, at its summit,—as in the Horse Chestnut.

Digynous; having 2 pistils, or 2 distinct stigmas.

Dilated; made wider; stretched or expanded.

Dimerous; composed of two parts,—as a dimerous calyx or corolla, when there are 2 sepals or petals.

Dimidiate; halved,—as if one side, or half had been cut off.

Dingy; of a dull, soiled, smoky, or leaden-brown color.

Dioecious; or **Dioicous**, having staminate and pistillate flowers on distinct plants.

Dioeciously, or **Dioicously polygamous**; having perfect and imperfect flowers on different plants.

Dipetalous; having 2 petals.

Discoid flower, or head. A disk of compound flowers, without ray-florets.

Disepalous; having 2 sepals.

Disk. The surface of the leaf; also the face, or central part, of a head of compound flowers.

Dissected; cut into segments, or lobes.

Dissepiment. The partition between the cells of seed-vessels.

Distant; having a larger intervening space than usual.

Distichous; two-rowed; bearing leaves, flowers, &c. in 2 opposite rows.

Distinct; separate; not connected with each other, nor with any contiguous organ.

Divaricate branches. Spreading so as to form more than a right angle with the stem above.

Divergent; spreading widely; making a right-angle, or nearly so, with the stem.

Divided; separated, or cleft to the base,—or to the midrib, if a leaf.

Dorsal; belonging to, or growing on, the back.

Dorsal suture. The line or seam on the back of a carpel, or folded leaf,—being at the place of the midrib; the opposite of *ventral suture*,—which see.

Dorsally compressed; flattened on the back.

Dots. Minute tubercles, or specks.

Dotted; covered with dots, specks, or minute and slightly elevated points.

Downy; clothed with soft fine hairs.

Drooping; inclining downwards, more than *nodding*.

Drupaceous; drupe-like,—of a structure resembling a drupe, or what is usually called *stone-fruit*.

Drupe. A fleshy, succulent, or spongy pericarp, without valves, containing a 1 or 2 seeded nut, or stone.

Drupelet. A little drupe; a constituent portion of a compound berry,—such as that of *Rubus*.

E, or Ea; in composition; destitute of; not furnished with.

Ebracteate; destitute of bracts.

Embracteolate; destitute of bractlets.

Ecaudate; destitute of a *cauda*, or tail.

Echinate; hedgehog-like; covered with prickles.

Elaters. Minute, club-shaped filaments, which are coiled round the spores of certain cryptogamous plants,—and by unrolling assist in dispersing those spores.

Elliptic, or elliptical; oval; longer than wide, with the two ends narrowing equally.

Elongated; exceeding the usual or average length.

Elongating; becoming gradually and finally elongated.

Emarginate; having a notch or sinus at the end.

Embryo. The young plant in the rudimentary state, as it exists in the seed.

Emersed; raised out of water.

Endocarp. That membranous or bony portion of the pericarp which lines the cavity, or forms the cells for the seeds (*ea. gr.* the stone, or hard shell, in a *Drupe*).

Endogenous plants. Those which have a single cotyledon,—and grow by *central deposits* of new matter, distending or pushing the older deposits outwards.

Endogens. Inside-growers; plants which increase by central or internal deposits of new matter. See *Endogenous plants*.

Enneandrous; having 9 stamens.

Ensiform; sword-shaped; two-edged and tapering from base to apex.

Entire; having a continuous even margin; without incision, notch, or tooth.

Envelope. An integument, or covering.

Ephemeral; diurnal; enduring one day only.

- Epicarp**; the outer coating of the pericarp, or fruit.
- Epidermis**; the outer skin or cuticle.
- Epigean**; situated, or rising, above ground.
- Epigynous**; adnate to the ovary so that the upper portion is apparently inserted on its summit,—as sepals, petals, and more especially stamens; exemplified in *Umbelliferae* and *Araliaceae*.
- Epipetalous**; inserted on the petals.
- Equal**; similar parts equal among themselves,—as calyx-segments, sepals, petals, stamens, &c.
- Epiphytes**; air plants having no immediate connexion with the earth, but growing on the stem of other plants.
- Equitant leaves**. When alternate distichous leaves are infolded lengthwise and towards each other, the outer ones inclosing or embracing the inner.
- Erect ovules, or seeds**. When they arise from the bottom of the ovary, or base of the cell, and point upwards.
- Eroded, or erose**; irregularly notched, as if gnawed by insects.
- Esulent**; eatable; fit or safe to be eaten.
- Etiolation**; the blanching of plants,—or rendering them white by the exclusion of light; as practised with *Celery*, *Endive*, &c.
- Evanescent**; disappearing; speedily vanishing.
- Even pinnate leaf**. With the leaflets all in pairs or without a terminal odd one; often termed *abruptly-pinnate*.
- Evergreen**; continuing green, and persisting all the year.
- Ecalbuminous**; destitute of albumen.
- Eccentric**; deviating from the axis, or centre.
- Exfoliate**; to throw off layers or plates,—as bark, &c.
- Exogenous plants**. Those which have 2 (or sometimes more) cotyledons,—and grow by annual layers of wood (or new matter) on the *outside*, between the old wood and bark.
- Exogens**; outside growers; plants which increase by annual additions to the outside. See *Exogenous plants*.
- Esert or exerted**; projecting, or protruding out,—as stamens from the tube of the corolla.
- Exstipulate**; destitute of stipules.
- Extrorse anthers**. Having the cells turned outwards, or from the pistils,—and the filament, or connective, extended up the inner side.
- Falcate**; sickle shaped; curved like a sickle, or scythe.
- Family of plants**. A definite group of kindred plants, called also an *Order*,—sometimes of numerous genera and species—sometimes comprising but a single genus.
- Fan shaped**; cuneate below, and spreading above,—like a lady's fan.
- Farinaceous**; mealy; reducible to a meal like powder.
- Fascicle**; a little bundle, or bunch, of flowers, leaves, &c., originating from nearly the same point.
- Fascicled or Fasciculate**; growing in bundles, or bunches from the same point.
- Fastigiate**; level-topped; the summits of the branches all rising to the same height.
- Favose**; deeply pitted; somewhat like a honey-comb.
- Feather veined leaf**. Where the lateral veins (or nerves) diverge regularly from each side of the midrib,—like the plumage of a quill.
- Ferruginous**; of the color of rust of iron; reddish-brown.
- Fertile**; having perfect pistils, and producing fruit.
- Fibrous**; composed of fibres, or thread-like processes.
- Fide**; on the faith, or authority, of.
- Filament**; that part of the stamen (usually thread like) which supports the anther.
- Filiform**; very slender and terete, like a thread.
- Fimbriae**; fringes, or fringe-like processes.
- Fimbriate**; finely divided at the edge, like a fringe.
- Fimbrillate**; clothed with *fimbrillae* (i. e., membranaceous, linear or subulate filaments)—as the receptacle of thistles, &c.
- Fissure**; a slit, crack, or narrow opening.
- Fistular, or Fistulous**; hollow and terete, like a pipe, tubular.
- Flabelliform**; fan shaped,—which see.
- Flaccid**; so limber as to bend by its own weight.
- Flagelliform**; long, slender, and pliable,—like a whip lash.
- Flexuose**; serpentine, or with a succession of short alternating curves.
- Floccose, or flocculent**; covered with *flocks*, flakes, or little matted bunches of partly detached tomentum.
- Floral**; belonging to, or situated near a flower.
- Floral envelopes**; the verticils, or coverings of flowers,—usually known as calyx and corolla; sometimes as chaff.
- Floret**; a little flower; usually one of the number in compound or aggregated flowers.
- Floriferous**; bearing flowers.
- Foliaceous**, of a leaf-like form and texture; resembling a leaf.
- Foliolate**; a leaflet in a compound leaf.
- Folicle**; a capsular fruit, opening longitudinally by a suture on one side.
- Follicular**; resembling, constructed like, or being, a folicle.
- Foramen** (plural, *foramina*); a roundish hole, or opening.
- Foréolate**; pitted.
- Free**; not adhering to each other, nor to any adjacent organ.

Frondose; leafy, or with leaf like appendages.
Fructification; the flower and fruit, with their parts.

Fruit; the mature ovary or seed-vessel, and its contents.

Frutescent; becoming shrubby, or hard and woody.

Fruticose; shrub-like, or shrubby.

Fruticulose; like a little shrub.

Fugacious; fleeting; of short duration.

Fulvous; tawny, fox or tan-colored.

Fungous; of rapid growth and soft texture, like the *fungi*.

Funiculus; the *little cord* by which seeds are attached to the placenta.

Funnel form; tubular below, and expanding above—like a funnel.

Furcate; forked.

Furfuraceous; scaly, or scurfy, like bran or dandruff.

Fuscous; greyish brown, or deep brown, with a tinge of green.

Fusiform; spindle-shaped; terete and tapering to a point.

Galea; a helmet; the arched upper lip of a ringent corolla.

Galeate; helmeted; resembling a casque, or helmet.

Gamopetalous; having the petals all more or less united,—forming what is called (rather incorrectly) a monopetalous corolla.

Gamosépalous; having the sepals all more or less united,—forming a monosepalous calyx.

Geminate; in pairs.

Generic; pertaining or relating to a genus.

Geniculate; forming an angle at the joints, like a bent knee.

Genus (plural *genera*); a group of species which agree with each other in the structure or essential characters of the flower or fruit; sometimes a genus comprises but a single species.

Germ; the growing part of a bud.

Germen; the old name for the ovary.

Germination; the sprouting, or incipient growth, of a seed.

Gibbous; hunched, or swelled out, on one or both sides.

Glabrous; very smooth, without any roughness or pubescence.

Gland; a small roundish organ, or appendage, which often secretes a fluid.

Glandular; furnished with glands.

Glandular-hispid, or *glandular-pubescent*; hairy or pubescent, and the hairs tipped with glands.

Glaucous; inclining to, or becoming, glaucous.

Glaucous; silvery; pale-bluish, or greenish-white; covered with a greenish white mealiness.

Globose, or *globular*; spherical; round on all sides.

Glomerate; densely clustered in small heaps, or irregular heads.

Glomerules; small dense, roundish clusters.

Glumaceous; chaff like; resembling chaff or glumes.

Glumes; the bracts, or outer chaff, embracing the spikelets of the grasses (calyx, of *Linn.*). See *Palea*.

Glutinous; viscid; covered with an adhesive fluid.

Grain; fruit of the true grasses, sometimes called a *caryopsis*.

Gramineous; grass-like; resembling grasses.

Graniferous; bearing a grain, or grains.

Granular; formed of grains or small particles.

Gymnospermous; having the seeds naked, —i. e. not inclosed in a pericarp.

Gynandrous; having the stamens growing on, or adhering to, the pistil.

Gynacium; a term designating the pistillate portion of the flower, or the seed-bearing organs, collectively.

Gynostegium; the pistil-cover or tube formed by the connate filaments, in the *Asclepias* family.

Habit of plants. Their general external appearance and mode of growth, by which they are recognized at sight.

Habitat, or *habitation*; the natural or native place of growth.

Halved; one sided,—as if one half had been cut off.

Hastate; shaped like a halbert; lanceolate, with a divaricate lobe on each side of the base.

Head; a dense roundish cluster of sessile flowers.

Heptandrous; having 7 stamens.

Herbaceous; not woody; of a tender consistence, and usually destructible by frost.

Herbarium; a collection of dried specimens of plants.

Herbs; plants which are not woody—of a more tender structure than trees and shrubs, and usually killed by frost.

Heterogamous heads; heads of Syngenesious flowers, containing florets of different structure and sexual character.

Heterophyllous; having leaves of different forms.

Hexamerous; consisting of 6 parts.

Hexandrous; having 6 stamens of equal length.

Hilum; the scar left on a seed, at the point of attachment to the funiculus.

Hirsute; rough-haired; clothed with stiffish hairs.

Hispid; bristly; beset with rigid, spreading, bristle-like hairs.

Hoary; covered with a white or whitish pubescence.

Homogamous heads. Heads of Syngenesious flowers, in which all the florets are of similar structure and the same sexual character.

Hooded. See *cucullate*.

Horizontal ovules. When they project

- from the side of the cell, pointing neither to base nor apex.
- Horn;** a process or elongation resembling a horn. See *Spur*.
- Horny;** of a texture or consistence like horn. See *corneous*.
- Humus.** The mould, or soil, formed by the decomposition of vegetable matter.
- Hyaline;** transparent, like glass.
- Hybrid;** a mule; a cross-breed between two varieties, or nearly allied species, partaking of each but different from both.
- Hypogæan;** situated, growing, or remaining, under ground.
- Hypogynous;** inserted beneath the ovary, —i. e., on the receptacle, and free from the surrounding organs.
- Icosándrous;** having about 20 stamens, which are perigynous, —i. e., growing to, or apparently inserted on the rim of, the calyx.
- Imbricate, or imbricated;** the edges lying closely and regularly over the next series, —like shingles on a roof, or scales on a fish.
- Imperfect flower;** when either stamens or pistils are deficient.
- Incised;** cut or gashed; separated by incisions.
- Inclinate, or inclined;** bent over towards the ground, or some other object.
- Included;** wholly contained within a tube, or cavity; the opposite of *exserted*.
- Incomplete flower;** when either Calyx or Corolla is wanting.
- Incrassate;** thickened upwards, or towards the summit.
- Incumbent;** lying upon, against, or across.
- Incumbent anther.** Attached at or near its middle, and lying horizontally across the summit of the filament.
- Incumbent cotyledons.** Having the radicle bent over and applied to the back of one of the cotyledons (represented by this sign o |).
- Incurved;** bent or curved inwards.
- Indefinite;** not distinctly limited, or defined; numerous, and of no constant or determinate number.
- Indehiscent;** not opening at maturity.
- Indigenous;** native; growing naturally, or originally in a country.
- Induplicate;** folded inwards.
- Indurated;** hardened; become hard.
- Inferior calyx.** Having the ovary above, and free from the calyx.
- Inferior ovary.** Situated apparently below the calyx, or rather its segments; —i. e., adnate to the tube of the calyx, and consequently bearing the segments (if any) at its summit.
- Inflated;** distended or swelled like a blown bladder.
- Inflexed, or inflexed;** bent suddenly inwards.
- Inflorescence.** The disposition or arrangements of flowers and their footstalks on a plant, —such as Umbel, Panicle, Raceme &c.
- Innate anther;** erect, having its base resting directly on the apex of the filament.
- Inserted;** fixed upon, or growing out of.
- Internode.** That portion of a culm, or stem, between the nodes or joints.
- Interpetiolar stipules.** Situated or originating between the petioles of opposite leaves.
- Interrupted;** having intervals; or the continuity broken.
- Interruptedly pinnate;** having smaller pinnae, or leaflets, between each pair of larger ones.
- Intra-petiolar stipules.** Situated within and above the petioles, —usually sheathing the branch above the axil of the leaf; as in *Platanus*.
- Introrse anthers.** Having the cells turned inwards, or towards the pistils, —and the filament, or connective, extending up the outer side.
- Inversely;** in a contrary position; end for end, or upside down.
- Involucel.** The verticil of leaflets at the base of an umbellet.
- Involucellate;** having involucels.
- Involucrate;** having an involucre.
- Involucre.** An assemblage of modified leaves accompanying certain forms of inflorescence, —usually verticillate at the base of an Umbel, —or in imbricated series beneath or around the heads of aggregated flowers.
- Involute;** rolled inwards.
- Irregular;** the component parts differing in size and shape.
- Keel.** A longitudinal central ridge on the back of a leaf, sepal, &c., resembling the keel of a boat: also, the lower pair of united petals in a papilionaceous flower.
- Keeled;** having a keel. See *Carinate*.
- Kernel;** the nucleus, or seed contained in a nut.
- Knot;** a node; a solid, inseparable, and often swelling joint, —as in the stem of the grasses, &c.
- Lacerate;** divided into irregular segments as if torn.
- Laciniate;** jagged; the margin irregularly cut into unequal segments.
- Lactescent;** milky; containing a milky or whitish juice.
- Lacunose;** pitted, furrowed, or having little cavities.
- Lamellate;** divided or dilated into thin plates.
- Lamina;** a thin layer or plate; the expanded or flat portion of a leaf, or petal, as distinguished from the petiole, or claw.
- Lanate;** woolly; clothed with wool.
- Lanceolate;** tapering gradually from near the base to the apex, —like the head of an ancient Lance, or Spear.
- Lance-linear, Lance-ovate, &c., linear,**

- ovate, &c., with something of the lanceolate form.
- Lance-ovoid*; egg-shaped, with a swelling base and tapering apex.
- Lanuginous*; clothed with a loose wool.
- Lateral*; at the side.
- Laterally* compressed; flattened on the sides; the lateral edges pressed towards each other.
- Lax*; loose, or limber; not compact.
- Leaflets*. Partial leaves; the constituent leaves of a compound leaf.
- Leaf-like* (*foliaceous*); having a texture and expansion resembling a leaf.
- Leafy* (*foliosus*); furnished or abounding with leaves.
- Legume*. A Bean,—or fruit formed of a single carpel of 2 valves, with the seeds affixed along the upper suture, only.
- Leguminous*; having the structure of a Legume; bearing or producing the fruit called a Legume, or Bean.
- Lenticular*; having the form of a lens: orbicular and compressed, but convex on both faces.
- Ligneous*; woody; of a firm woody texture.
- Lignescence*; becoming somewhat woody.
- Ligulate*, strap-shaped, or ribband-shaped; flat and linear.
- Ligule*; the usually membranous appendage at the base of the leaf, or summit of the sheath, in the grasses.
- Limb*; the summit of a monosepalous calyx; or the upper spreading part of a monopetalous corolla.
- Line*; the twelfth part of an inch.
- Linear*; of an uniform width; long and narrow with parallel sides.
- Linear-lanceolate*, &c.; partaking of both forms, but more of the latter.
- Lip*; the upper or under division of a labiate flower; or the lower perianth-segment of many Orchidaceous flowers.
- Lobe*; the division, or segment, of a petal, or leaf: the free portion of a gamopetalous corolla.
- Lobate*, or *lobed*; cut or divided into lobes.
- Loculicidal* dehiscence; when the pericarp opens naturally on the back of a cell (*i. e.* at the dorsal suture) directly into the cavity.
- Loment*; an indehiscent 2- or several-seeded legume, contracted between each seed, and finally separating at the joint-like contractions.
- Lomentaceous* legume, or pod; a pod of 2 or more seeds, with a joint-like contraction, or transverse partition, between the seeds.
- Longitudinal*; lengthwise; parallel with the axis, or in a direction from the base towards the summit or apex.
- Lunate* or *lunulate*; having the figure of a new moon.
- Lutescent*; yellowish.
- Lyrate*; lyre-shaped; pinnatifid, with the terminal segment largest and mostly rounded.
- Mamillate*; conical, with a rounded apex.
- Marcescent*; withering and shrivelling on the stem, instead of falling off.
- Margin*. The edge or circumference of a leaf, or other expansion; also, the thin wing-like border of certain seeds, &c.
- Marginal*; belonging to, or situated at, the margin.
- Marginate* or *margined*; having a border or edging of a texture or color different from that of the disk; surrounded by a wing-like expansion, or narrow membrane.
- Medullary rays*. Bands or thin plates of cellular tissue, which pass from the pith to the bark, in woody stems.
- Melliferous*; producing or containing honey.
- Membranaceous*, or *membranous*; thin, flexible, and often slightly translucent.
- Mericarp*; a name given to the indehiscent carpel of the UMBELLIFERÆ.
- Micropyle*; the small foramen, or opening in the proper coats of a seed, to which the radicle always points.
- Midrib*. The main central nerve of a leaf, apparently a continuation of the petiole.
- Monadelphous*; having the filaments all united in one set, usually forming a tube.
- Monándrous*; having a single stamen.
- Mono*; in composition; one or single.
- Moniliform*; arranged like, or resembling the beads of a necklace.
- Monoclinous*; having the stamens and pistils in the same flower.
- Monocotyledonous* plants. Where the embryo has but a single lobe, or cotyledon.
- Monograph*. A description (usually ample and elaborate) of a single thing, or class of things, as of a Genus, Tribe, or Family, &c.
- Monogynous*; having but one pistil.
- Monœious*, or *Monoicous*; having staminate and pistillate flowers distinct, but on the same plant.
- Monœiously* or *monoicously* polygamous; having perfect and imperfect flowers on the same plant.
- Monopetalous*; having but one petal; or, more correctly, the petals united into one. See *gamopetalous*.
- Monophyllous*; consisting of a single leaf.
- Monosépalous*; consisting of one sepal, or rather, several sepals united more or less completely. See *gamosepalous*.
- Mucronate*; terminated by a *mucro*, or small projecting point, usually the prolongation of the midrib, in leaves.
- Mucronulate*; having a small *mucro*, or terminal projecting point.
- Multifid*; many-cleft; cut into numerous segments.
- Multiple*. A number containing another number several times without a fraction, or remainder; as 9 is a multiple of 8.
- Multiple* fruits. Where there is a combi-

- nation of several flowers into one aggregate mass, as in the Pine-apple, Mulberry, &c.
- Muricate*; armed or covered with short spreading points, or acute excrescences, like a *Murex*.
- Mutic* or *muticous*; awnless or pointless: the opposite of mucronate.
- Naked*; destitute of the usual covering, or appendage,—as a *stem* without leaves or scales, *leaves* without pubescence, *corolla* without a calyx or crown, *seeds* without a pericarp, a *receptacle* without chaff or hairs, an *umbel* without an involucre, &c.
- Napiform*; turnip-shaped.
- Natural Order*, family, or tribe. An association or group of kindred genera,—or of plants which are nearly related in their structure, and most important characters.
- Nectariferous*; producing honey.
- Nectary*. That organ, or portion of a flower which secretes honey; a term formerly applied to all disguised or modified forms of petals and stamens.
- Nerved*; having nerves, or coarse rib-like fibres.
- Nerves*. Rib-like fibres (in leaves, &c.) which usually extend from the base to, or towards the apex.
- Neutre* or *neutral* flower. Having neither stamen nor pistil.
- Nodding*; turning downwards; somewhat drooping.
- Node*. The knot, or solid and often tumid joint of a stem or branch.
- Nodose*; having numerous nodes or tumid joints.
- Normal*; according to rule; agreeing with the pattern or type.
- Nuciform*; nut-like; resembling a nut.
- Nucleus*. A central body; the seed or kernel of a nut.
- Nucules*. Little nuts, or nut-like fruit.
- Nut*. A hard 1-celled indehiscent fruit, usually containing a single seed.
- Ob*; a preposition which inverts the usual meaning of the word to which it is prefixed.
- Obcompressed* akenes (in the *Compositæ*). Flattish, with the greatest diameter from right to left,—or with the flattened side to the front, or periphery of the head.
- Obconic*; inversely Conical,—i. e., with the point or apex downwards.
- Obcordate*; heart-form, with the sinus at summit, and the narrowed point at place of insertion.
- Oblanceolate* inversely lanceolate,—or with the widest part above the middle, and tapering gradually to the base.
- Oblique*; a position between horizontal and erect; also descriptive of the base of a leaf, etc., when it is unequal or produced on one side.
- Oblong*; longer than wide, with the sides parallel, or nearly so.
- Obovate*; inversely ovate,—or with the broadest end above.
- Obovoid*; inversely ovoid.
- Obsolete*; indistinct, as if worn out.
- Obtuse*; blunt, or rounded.
- Obversely*; turned contrary to the usual position.
- Ochrea*. A membranous stipular sheath, embracing the stem like a boot-leg; as in *Polgonum*, etc.
- Ochroleucous*; yellowish-white, or cream colored.
- Octandrous*; having 8 stamens.
- Odd-pinnate* leaf. Having the leaflets in opposite pairs, with a terminal odd one; often termed *impari-pinnate*.
- Officinal*; used in, or belonging to, a shop, or medical office.
- Oleraceous*; of the nature or quality of pot-herbs.
- Opaque*; not transparent.
- Opércular*; opening like a lid that is fixed by a hinge at one side.
- Opposite*; situated directly against each other, or at the same height, on contrary sides of the stem.
- Orbicular*; circular and flat, like a coin: the length and breadth equal and the circumference an even circular line: a term applied to leaves, or flattened bodies. See *Terete*.
- Order*. A family or group of allied natural objects; a subdivision of a *Class*, embracing kindred *Genera*.
- Ordinal*; belonging to the Orders, or to an Order.
- Ordinal names*. The names of the Natural Orders, or families of plants.
- Orthotropous* ovule or seed. Straight; not curved, or turned from its original or natural direction.
- Oval*; longer than broad, with the two ends of equal breadth and curvature, and the sides curving from end to end.
- Ovary*. The young seed-vessel, or fruit; the hollow portion at the base of the pistil, containing the *ovules*, or bodies destined to become seeds.
- Ovate*; flat, with the outline of a longitudinal section of an Egg; a somewhat oval figure, but broader near the base.
- Ovate-lanceolate*; lanceolate, inclining to ovate at base.
- Ovate-oblong*; oblong, with an ovate dilatation near the base.
- Ovoid*; egg-shaped; *terete*, and swelling near the base—i. e., having the outline of an entire egg.
- Ovoid-oblong*; the ovoid form lengthened out.
- Ovules*. The rudiments of future seeds, contained in the *Ovary*, or young fruit.
- Palate*. The prominence in the lower lip of a personate corolla.
- Palea* (plural *paleæ*). Chaff; a term applied to the inner, or immediate floral covering of the Grasses. (Corolla of *Linn*). See *Glumes*.

Paleaceous; chaffy; of a chaffy texture,—or furnished with chaff-like scales.

Palmate; hand-shaped; deeply divided, with the segments nearly equal and spreading like fingers on the open hand.

Palmately veined, or cleft,—having the veins or segments divergent, like the spreading fingers of an open hand.

Panduriform; fiddle-shaped; oblong, with the sides contracted, like a violin.

Panicle. A loose irregular compound raceme,—in which the peduncles are unequally elongated and variously and irregularly subdivided; as in Oats, &c.

Panicled, or **paniculate**; disposed in the form of a panicle.

Papilionaceous corolla. Butterfly-shaped; when complete, consisting of 5 petals,—the upper one (mostly largest) called the *vexillum* or banner,—the 2 lateral ones termed the *alae* or wings,—the 2 lower ones more or less cohering by their lower margins, and from their form, denominated the *keel*.

Papillate, or **papillose**; having the surface covered with fleshy dots, or points, like minute teats.

Pappus. The crown of the fruit,—being the segments, or free portion of an adherent calyx, in the *COMPOSITÆ*, and some other plants,—usually hairy-like or plumose,—sometimes in the form of minute chaff or scales.

Parasite. A plant growing on, or deriving sustenance from, another plant; as Dodder, Mistletoe, &c.

Parasitic; being or relating to, a Parasite.

Parénchyma. The soft spongy cellular tissue (often green), which forms the pith of stems, the pulp of leaves and young fruit, and fills the interstices of woody or vascular fibres.

Paries (plural, *parietes*). The outside wall, or enclosing shell, which circumscribes the cavity of a pericarp.

Parietal; affixed to, or belonging to, the *paries* or outer wall of the seed-cell of a pericarp.

Parietal placentæ. When the placentæ are borne upon the *walls*, instead of the axis, of the ovary or pericarp.

Parted; divided deeply, almost to the base.

Partial; a term applied to constituent portions of a compound whole.

Partition. See *Dissepiment*.

Pateliform; in the form of little plates or dishes.

Pectinate; finely, regularly and deeply cleft, so as to resemble the teeth of a comb.

Pedate leaf. Like a bird's foot; divided nearly to the petiole in narrow segments, with the lateral ones diverging.

Pedicel. A partial peduncle; the ultimate branch or division (next to the flower, or fruit), in a compound inflorescence.

Pédicellate; having, or being supported on a pedicel.

Peduncle; a simple flower stem; also the common foot-stalk of a compound inflorescence.

Pedunculate; having a peduncle; not sessile.

Pellucid; transparent; pervious to light.

Pellucid-punctate; having punctures which permit light to pass through.

Peltate; like a shield; having the footstalk affixed to the under surface, and not to the margin.

Pencil-form; resembling a painter's pencil or little brush.

Pendulous; hanging down; attached at one end, and swinging loosely.

Pendulous ovules or seeds; when their direction is downwards.

Penicillate; tipped or tufted with hairs, like a painter's pencil.

Penni-nerved leaf. Having the lateral nerves pinnately arranged, or feather-like. See *Feather-veined*.

Pentagonal; having 5 angles or corners.

Pentágynous; having 5 pistils.

Pentámerous; composed of 5 parts.

Pentándrous; having 5 stamens.

Pentapetalous; having 5 petals.

Penultimate; next to the last; the one next to the terminal one.

Pepo; an indehiscent, fleshy or internally pulpy fruit; usually composed of 3 carpels invested by the calyx tube, and with a firm rind; as the Melon, &c.

Percurrent; extending or running the whole way through.

Perennial; living more than two years, and for an indefinite period.

Perfect flower; having both stamen and pistil (1 or more of each), and producing fruit.

Perfoliate; having the stem apparently pierced through the leaf.

Perianth; a term for the envelopes of a flower, where the calyx and corolla are not clearly distinguishable.

Pericarp; the seed vessel, or fruit; the ovary in a mature state.

Perigónium; a name for the envelope of the flower,—said to be *double* when there is both calyx and corolla, but often used synonymously with *Perianth*, which see.

Perigynium; the sac (formed by the union of 2 bractlets) which encloses the ovary of the *Carices*.

Perigynous petals and stamens. Inserted on the calyx,—or rather adhering to the inner surface of the calyx tube,—and thus surrounding the pistils.

Peripheral; fixed or coiled round the circumference, or periphery.

Perisperm. a deposit in many seeds, affixed to, or surrounding, the embryo—synonymous with *albumen*—which see.

Peristome; the circle of teeth or bristle-like processes which surround the orifice of the *Theca* or capsule of the *Mosses*.

- Persistent**; not falling off; remaining beyond the time when similar organs usually fall off.
- Personate corolla**. Masked; having the throat closed by a prominent palate, as in *Linaria*.
- Petal**. The (usually) delicate colored flower leaf. In a flower of one petal (or united petals), the corolla and petal are the same; in a flower of more than one petal the corolla is the whole and the petals are the parts.
- Petaloid**; petal like; delicate and colored, or expanded, like a petal.
- Petiolar**; seated on, or belonging to, the petiole.
- Petiolate**; having, or being supported on, a petiole; not sessile.
- Petiole**. The stem or foot-stalk of a leaf.
- Petiolulate**; having a partial or subdivided petiole.
- Petiolule**. A little or partial petiole; the foot stalk of a leaflet.
- Phanogamous**, or *phanerogamous*; having visible genuine stamens or pistils; bearing true flowers.
- Phyllodium**. The imitation, analogue, or substitute of a leaf,—usually the dilated foliaceous petiole of an abortive compound leaf.
- Pilose**; hairy; composed of, or clothed with, distinct straightish hairs.
- Pinnæ**. The paired or opposite leaflets of a pinnate leaf.
- Pinnate leaf**; having distinct articulated leaflets in pairs, on opposite sides of a simple petiole.
- Pinnatifid leaf**, or frond. Cleft in a pinnate manner, but the segments united or confluent at base.
- Pinnatifidly**; in a pinnatifid manner.
- Pinnatisect**; pinnately dissected or divided,—but the segments not articulated with the petiole.
- Pinnules**. The leaflets or subdivisions of a bi-tri- or multi-pinnate leaf, or frond.
- Pistil**. The central organ of a fertile flower,—consisting usually of *ovary*, *style*, and *stigma*: sometimes the *style* is wanting,—or, in other words, the stigma is sessile.
- Pistillate flowers**. Those which have pistils, but not stamens.
- Pistilliferous**; bearing pistils.
- Pitted**; having small shallow depressions.
- Placenta** (plural, *placentæ*). That part of a pericarp to which the seeds are attached; the line, or ridge projecting in the cavity of the ovary, which bears the ovules.
- Placental**; pertaining to the placenta.
- Placentiferous**; bearing the placenta.
- Plane**; flat, and with an even surface.
- Plano-convex**; flat on one side and convex on the other.
- Plicate**; plaited; folded or crimped, like a fan, or ruffle.
- Plumose**; feather-like. A *pappus* is plumose, when each hair has other hairs arranged on opposite sides of it,—as in *Cirsium*.
- Pod**. A dry seed-vessel, narrow and more or less elongated, and usually of 2 valves. The term is often applied indiscriminately to both *Legumes* and *Siliques*.
- Pollen**; the fertilizing powder contained in the anthers.
- Pollen-masses**, or *Pollinia*. The waxy masses of pollen, in the *Asclepias* and *Orchis* families.
- Poly**, in composition; many.
- Polyadelphous**; having the filaments united in 3 or more parcels.
- Polyandrous**; having more than ten hypogynous stamens.
- Polycotyledonous**; having many seed-leaves.
- Polygamo-dioicous**, or *dioicous*; having perfect and imperfect (or fertile and sterile) flowers on distinct plants.
- Polygamous**; having some flowers perfect, and others either staminate, pistillate, or neuter.
- Polygynous**; when the pistils are numerous or indefinite.
- Polymorphous**; variable; assuming, or apt to assume, many different forms.
- Polypetalous**; having many distinct petals,—or, at least, more than one.
- Polysépalous**; having many distinct sepals,—or more than one.
- Pome**. An apple; a fleshy fruit formed of several cartilaginous or bony carpels, imbedded in pulp and invested by the tube of the adherent calyx.
- Pores**; small holes, or tubular openings.
- Porous**; full of holes, cells, or tubular openings.
- Pramorse**; end-bitten; ending blunt, as if bitten off.
- Precocious flowers**; appearing before the leaves.
- Prickle**. A sharp process arising from the bark, only,—and not originating in the wood.
- Primary**; first in a series in order of time, or in importance,—opposed to *secondary*.
- Primordial**; first in Order; usually applied to the first genuine leaves,—or those which are next above the cotyledons or seminal leaves.
- Prismatic**; like a prism; having several angles and intermediate flat faces.
- Process**. A protuberance, eminence, or projecting part.
- Procumbent**; lying on the ground, without putting forth roots.
- Produced**; extended, or lengthened out.
- Proliferous**; producing its like in an unusual way,—as lateral bulbs; or putting forth a young and unusual accessory growth, from the centre of an umbel, flower, &c.
- Prostrate**; lying flat, or close on the ground

Pruinose; covered with a glaucous mealliness, like a *plum*.

Pseudo pinnate; falsely or imperfectly pinnate,—the leaflets (or rather segments) not articulated at base: See *Pinnatisect*.

Puberulent; covered with a minute, short and fine pubescence.

Pubescence. A general term for the hairy covering of plants.

Pubescent; clothed with hairs,—especially with short weak hairs.

Pulp. A soft, fleshy or juicy mass.

Pulvérulent; dusty; composed of, or covered with, a fine powder.

Punctate; appearing as if pricked full of small holes, or covered with indented points.

Puncticulate; having very minute punctures, or indented points.

Pungent; sharp-pointed, prickly at apex; also acrid.

Pyramidal; tapering upwards; usually applied to 4-sided solids which diminish to the apex.

Pyriform; shaped like a pear; largest at the upper end.

Quadrangular; four-angled.

Quadrifurcous; in 4 rows, or directions; facing or pointing 4 ways.

Quadrifid; 4-cleft.

Quaternate; 4 together; arranged in fours.

Quinate; 5 together; arranged in fives.

Race of plants. A fixed and peculiar form or modification,—produced by the crossing or blending of distinct varieties; or sometimes, perhaps, accidental forms rendered permanent by culture, or other influences.

Raceme. A mode of flowering, in which the common peduncle is elongated, with the flowers on short lateral simple pedicels.

Racemose; having the flowers in racemes.

Rachis or *Rhachis*. The common peduncles, or elongated receptacle, on which florets are collected in a spike; also the midrib of a pinnatisect frond.

Radiate; having rays (i. e. spreading ligulate florets) at the circumference; as the heads of many *Compositæ*.

Radiate-reined; where the veins of a leaf diverge from a common centre, or point, at the summit of the petiole.

Radiatiform: a term applied to heads of compound flowers in which all the florets are ligulate, and directed towards the circumference.

Radical; belonging to, or growing immediately from, the root.

Radicating; sending out roots, or striking root at the nodes.

Radicula. A little root; the slender fibrous branch of a root.

Rumeal; pertaining or belonging to the branches.

Ramification. The branching or division of an organ into several parts.

Ramose; branching.

Rank. A row, or arrangement in a line.

Raphe. The line, or little ridge, on one side of anatropous (i. e., inverted) ovules and seeds,—formed by the adhesion of a portion of the funiculus.

Ratoon (Span. *Retono*). A sprout from the root of a plant which has been cut off (chiefly used in reference to the Sugar-cane).

Rays. The spreading ligulate florets round the disk of a compound flower; also, the footstalks, and enlarged marginal flowers, of an umbel.

Receptacle. The apex of the peduncle (much dilated in the *Compositæ*), on which the parts of a flower (or entire florets) are inserted; the seat of the fruit, or of seeds and their equivalents.

Recurved; curved backwards.

Reflexed; bent or doubled backwards.

Regular; having the parts uniform and equal among themselves,—as the lobes or petals of a corolla.

Remote; seated or growing at an unusual distance.

Réniform; kidney-shaped.

Repand; having the margin slightly indented with shallow sinuses.

Replicate; folded back on itself.

Réplum. A name given to parietal placentæ when separated from the valves; also, the persistent border of a fallen legume.

Resupinate; turned upside down.

Reticulate; netted; having veins or nerves crossing each other, or branching and reuniting, like network.

Retorse, or *retorsely*; pointing backwards or downwards.

Retuse; having a shallow sinus at the end.

Revolute; rolled backwards, or outwards.

Rhizoma. A root-stock,—or root-like subterraneous stem.

Rhombic, or *rhomboid*; rhomb-shaped; having four sides, with unequal angles.

Ribbed; having ribs, or longitudinal parallel ridges.

Ribs. Parallel ridges, or nerves, extending from the base to, or towards, the apex.

Rigid; stiff, inflexible, or not pliable.

Ringent; gaping, with an open throat.

Root-stock. See *Rhizoma*.

Róstrate; beaked; having a process resembling the beak of a bird.

Rosulate; in a rosette; arranged in circular series, like the petals of a double rose.

Rotate corolla. Wheel-shaped; monopetalous (or gamopetalous) and spreading almost flat, with a very short tube.

Rough; covered with dots, points, or short hairs, which are harsh to the touch.

Round; circular, or globular; not angular. See *globose*, *orbicular*, and *terete*.

Rudiment. An imperfectly developed organ.

- Rufescent**; becoming reddish-brown, or rust-colored.
- Rufous**; reddish-brown, or rust colored.
- Rugose**; wrinkled.
- Rugulose**; finely wrinkled.
- Ruminated**; a term applied to a variegated albumen—i. e., when its substance is wrinkled or plicate, and the investing membrane prolonged within the folds.
- Runcinate**; resembling the teeth of a mill-saw; somewhat pinnatifid, with the segments acute and pointing backwards.
- Runner**. A slender shoot, producing roots and leaves at the end, only,—and at that point giving rise to another plant: exemplified in the Strawberry plants.
- Sac**. A membranous bag, or boundary of a cavity.
- Saccate**; having, or being in the form of, a sac, or pouch.
- Sagittate**; arrow-shaped; notched at base, with the lobes (and frequently the sinns) acute.
- Salver-form, or salver-shaped**; tubular, with the limb abruptly and flatly or horizontally expanded.
- Samara**. A kind of Akene, or dry indehiscent pericarp, having a winged apex, or margin,—as the Maple, Ash, Elm, &c.
- Samaroid**; winged or margined like a Samara.
- Sarcocarp**. The fleshy portion of a pericarp (ex. gr. of a Drupe) between the Epicarp and the Endocarp.
- Sarmentose**; having, or sending forth, or being in the form of runners.
- Scabrous**; rough with little points, or hairs.
- Scales**. Small thin plates, or leaf-like processes; also the leaflets of the involucre, in the *COMPOSITÆ*.
- Scandent**; climbing,—usually by means of tendrils.
- Scape**. A peduncle proceeding directly from the root, and mostly naked.
- Scarious**; dry and skinny,—generally transparent.
- Scattered**; disposed or distributed thinly, without any regular order.
- Scorpioid inflorescence**; rolled back from the apex (circinate), before development.
- Scrobiculate**; having the surface excavated into little pits, or hollows.
- Scutellate**; shaped like, or resembling, a target or shield.
- Seam**. See *Suture*.
- Secund**; one ranked; all seated on, or turned to the same side.
- Seed**; the matured ovule, with the Embryo, or young plant, formed within it.
- Segment**. The division, or separated portion, of a cleft calyx, leaf, &c.
- Semi**; half; as *semi-bivalved*, half 2-valved,—*semi-terete*, half-round, &c.
- Sempervirent**; always green; living through the winter, and retaining its verdure.
- Sepal**. The leaflet, or distinct portion of a calyx.
- Sepaloid**; resembling sepals; green and not petal-like.
- Septicidal dehiscence**. When a compound pericarp opens by splitting the dissepiments—i. e., the carpels separate from each other, and open to the seeds by the ventral suture.
- Septiferous**; bearing a septum.
- Septifugal dehiscence**. When the dissepiments remain attached to the axis, while the valves break away from them.
- Septum**. The partition which divides the cells of fruit.
- Sericeous**; silky; covered with soft smooth glossy appressed hairs.
- Series**. A division or comprehensive group of objects in Natural History; also, a continued succession of things of the same Order.
- Serrate**; sawed; having sharp teeth on the margin, pointing towards the apex.
- Serratures**. The teeth, or sharp segments of a serrate margin.
- Serrulate**; finely serrate; having small teeth or serratures.
- Sessile**; sitting closely; without any foot-stalk or pedicel.
- Seta** (plural *Setæ*). A bristle; a stiffish elastic hair.
- Setaceous**; bristle-like; resembling a bristle in size and figure.
- Setose**; bristly; having the surface covered with bristles.
- Sheath**. A membranous expansion which is tubular, or convolute, and enclosing or embracing a stem.
- Sheathed**; enclosed or embraced by a sheath.
- Sheathing**; embracing the stem with a sheath.
- Shining**; glossy smooth and bright.
- Shrub**. A small woody plant, branching near the ground,—often without any principal stem.
- Shrubby**; hard and woody; of the texture and size of a shrub.
- Silicle**. A little or short silique, nearly as wide as long.
- Silique**. A long slender pod, or membranous seed-vessel of 2 valves, having the seeds fixed alternately along both sutures.
- Siliquose**; having siliques,—or resembling a silique.
- Simple**; undivided; not branched; not compound.
- Simple Umbel**. When each ray terminates in a single flower,—instead of a secondary or partial umbel.
- Sinuate**; having sinuses, scallops, or gashes which are open and rounded at bottom.
- Sinuate-dentate**,—*Sinuate-serrate*; having teeth, or serratures, with the clefts or openings rounded at bottom.
- Sinus**. An open notch; a rounded incision, or scallop.

Solitary: standing alone; one only in a place.

Spadix. A sort of dense flowered, fleshy or club-like Spike,—usually enveloped by, or proceeding from, a sheathing involucre called a Spathe.

Span; a measure of 9 inches.

Spathaceous; having a spathe, or resembling a spathe.

Spathe. A sheathing kind of bract, common calyx, or involucre, open on one side,—often containing the spadix.

Spáthulate, or *spátulate*; like a spatula; obovate-oblong, or larger and rounded at the end, and tapering to the base.

Species. The lowest permanent division of natural objects, in a systematic arrangement; a group comprising all similar individuals.

Specific; belonging to, or distinguishing the species.

Sphacelate; dark colored, as if gangrenous, or dead.

Sphagnous; full of bog-moss, or *Sphagnum*.

Spicate; in the form, or after the manner of a spike.

Spike. A kind of inflorescence in which the flowers are sessile on the sides of a long common peduncle, or rachis.

Spikelet. A little spike,—or subdivision of a compound spike.

Spindle-shaped; see *fusiform*.

Spine. A thorn; a sharp process originating in the wood—*i. e.*, pointed abortive branch.

Spinulose; armed with minute spines.

Spinescent; becoming thorny,—or inclining to be thorny.

Spinose; thorny; armed with thorns.

Spinulose; covered with small spines.

Spores, or *sporules*. The seminal equivalents, or analogues of seeds, in cryptogamous plants.

Spur. A tapering hollow production of the base of a petal, or sepal,—usually called a nectary.

Spurred; having a spur, or spur-like elongations.

Squamose; scaly; covered more or less with scales.

Squarrose; jagged; having spreading tips, or divaricate points, all round,—as the scales of some involucre.

Stamen. The organ of a flower which prepares the pollen,—usually consisting of a filament and anther, and situated between the corolla and pistils.

Staminate flower. Having stamens, but not pistils.

Staminiferous; bearing or supporting the stamens.

Staminodia. Imperfect organs occupying the position of, and resembling stamens,—being the transition stage between petals and stamens.

Stellate; like a star; arranged like the rays of a star.

Stellular; radiating after the manner of little stars.

Stellular pubescence. Compound or fasciculate hairs, with the branches spreading like rays.

Stem. The main axis or body of a plant; the common supporter of branches, leaves, flowers and fruit.

Stemless; having no visible or aerial stem: applied to plants where the stem is suppressed, or so short as to be apparently wanting.

Sterile; barren, or unproductive; applied to flowers which produce no fruit.

Stigma. The summit of the style,—or that portion of the pistil through which the pollen acts.

Stigmatic; belonging, or relating to the stigma.

Stigmatiferous, or *stigmatose*; bearing, or belonging to, the stigma.

Stipe. A little pedicel, or footstalk, of seeds, &c.

Stipellate; furnished with *stipelles*,—*i. e.*, the stipules of leaflets, in compound leaves.

Stipelles. The stipular appendages, or little stipules, of leaflets, in compound leaves.

Stipitate; having a stipe; supported on a little pedicel.

Stipitiform; resembling a stipe.

Stipular; belonging or relating to stipules.

Stipulate; furnished with stipules.

Stipules. Leaflets, or leaf-like appendages, at the base of a petiole, or leaf.

Stoles (*i. e.* *stolones*—corruptly *stools*). The shoots, suckers, or off-sets, from the base of the stem, or roots of plants: usually applied to young winter grain,—as wheat, &c. See *Tiller*.

Stoloniferous; having suckers, off-sets, or running shoots (*stolones*), from the base of the stem, or crown of the root.

Striae. Fine parallel ridges or lines.

Striate; marked with longitudinal lines, or stripes.

Striate-sulcate; scored with minute longitudinal grooves and ridges.

Strict; straight and rigidly upright.

Strigose; armed with spreading bristly hairs, which taper from base to apex.

Stróbile. The cone, or collective fruit, of the Pines, Firs, &c.

Stróphiole. A little crown, or fungous appendage to the hilum of a seed.

Style. The columnar (usually slender) portion of the pistil, between the ovary and the stigma,—sometimes wanting.

Styliferous; bearing or producing a style, or styles.

Stylopodium. The foot or thickened base of the style (or united styles), at the junction with the epigynous disk,—as in *UMBELLIFERÆ*.

Sub—a preposition signifying *under*, or a *division*,—as a *Sub-class*, *Sub-order*, &c.: also employed as a diminutive, or quali-

- fying term, equivalent to *almost*, *somewhat*, or *about*,—as *sub-sessile*, nearly sessile, &c.
Suberose; of a texture resembling cork.
Sibulate; shaped like an awl-blade; linear or cylindric below, angular and tapering to a sharp point at summit.
Succulent; juicy; full of juice.
Sucker. A shoot, or off-set, from the root, or base of the stem.
Suffrutescent; almost shrubby.
Suffruticose; somewhat shrubby; shrubby at base.
Sulcate; furrowed, or grooved.
Super, or *supra*; a preposition signifying above or upon, beyond or more than,—as *super-axillary*, situated above the axil.
Super—or *Supra-decompound*; more than decompound; many times subdivided, or compound.
Superior; above; a term applied to the ovary when it is above the calyx, or free in the flower; also to the calyx, when the tube is adherent to the ovary, and the segments borne on its summit.
Suppression; the non-production, or failure in the development of an organ.
Surculose; bearing suckers, or off-sets.
Suspended ovules, or seeds. When they are attached to the summit of the ovary, or pericarp, and hang perpendicularly in the cavity.
Suture. The line, or seam, formed by the junction of two margins.
Symmetrical flower. When there is an equal number of parts in each series, or verticil.
Syngenesious, having the anthers united,—as in the *COMPOSITÆ*.
Synonym. Another name for the same thing.
Tenacious; sticky or adhesive; also holding on by means of very small hooked points.
Tendril. A filiform twining branch, or appendage, by which some plants climb, or sustain themselves; in the grape vine, it is an abortive raceme.
Térete; round, like a column,—and either cylindric or tapering; applied to stems, or stem-like bodies. See *orbicular*.
Terminal; situated at, or proceeding from, the end or summit.
Ternary; arranged in threes; consisting of three parts, or elements.
Térnate; three-fold; three together,—as the leaflets of clover, &c.
Tessellated; resembling mosaic work; in little squares, or checkers, like a chess-board.
Testa. The outer integument, or proper coat, of a seed.
Tetradynamous; having 4 long and 2 short stamens, in a cruciate flower.
Tetrágonous; 4 cornered, or having 4 angles.
Tetrámerous; consisting of 4 parts, or constituent portions.
Tetrandrous; having 4 stamens of equal length.
Thorn. A sharp process from the woody part of a plant,—being a stunted or abortive branch.
Throat. The orifice or passage into the tube of a corolla.
Thyrsoïd; resembling, or being in the form of a *Thyrus*.
Thyrus. A kind of contracted, or dense, ovoid panicle,—as in the *Lilac*, *Horse-Chestnut*, &c.
Tiller. A sucker, or young shoot of *Wheat*, *Rye*, &c.
Tiller, or *tillow*; to put forth suckers, or new shoots, from the root, or base of the stem—as *Wheat*, &c. See *stole*, or *stool*.
Tissue. Web, or fabric; the intimate organic structure, or composition, of bodies; especially those which are, or have been, alive.
Tomentose; covered with a curled, or matted, cottony pubescence.
Tomentum. A matted downy or cottony pubescence.
Toothed. See *dentate*.
Torose, or *torulose*; swelled out in obtuse ridges.
Tortuous; bent in different directions.
Torus. The bed, or receptacle at the apex of a flower-stalk, on which are inserted all the parts of the flower.
Translucent; clear, or transmitting light faintly.
Transverse, *transversely*; across; cross-wise; at right-angles with lengthwise.
Triadelphous; having the filaments united in 3 parcels.
Triándrous; having 3 stamens.
Triangular; having 3 angles, corners, or points.
Tribes. Groups of kindred plants, intermediate between Orders and Genera.
Tribrácteate; having 3 bracts.
Trichotomous; three-forked; dividing by 3 equal branches.
Tricoccous; composed of three separable indehiscent carpels or (*cocci*).
Tricuspidate; having, or terminating in, 3 sharp points.
Trifarious; facing, or pointing, in 3 directions.
Trifid; three cleft; partially cut or divided into 3 segments.
Trifoliate; having 3 leaves; or the leaves arranged in threes.
Trifoliolate; 3 leaflets together.
Trigonous; three cornered.
Trigynous; having 3 pistils.
Trilobate; three lobed.
Trimerous; consisting of 3 parts.
Tripártite; three parted.
Tripétalous; having 3 petals.
Tripinnate; thrice pinnate; the common

petiole 3 times divided, or with bipinnate divisions on each side.

Tripinatifid; pinnately dissected, with the primary divisions twice pinnatifid.

Triplinerved; having 3 principal nerves from the base.

Triquetrous; having 3 angles and 3 flat sides, as the culms of many CYPERACEÆ.

Trisepalous; having 3 sepals.

Triterminate leaf. When the petiole is twice divided ternately, and each final branch bears 3 leaves.

Truncate; having the end blunt, as if transversely cut off.

Tube; a pipe or hollow cylinder.

Tuber. A solid fleshy knob attached to roots.

Tubercle. A small excrescence, knob, or point on a surface, making it rough or uneven.

Tuberculate; covered with tubercles.

Tuberiferous; bearing or producing tubers.

Tuberous, consisting of, or fleshy and solid like tubers.

Tubular; having a tube, or constructed like a tube.

Tuft; a bunch or fascicle growing from the same root, or originating nearly at the same point.

Tumid; swelled, or enlarged like a swelling.

Tunicate; coated; having concentric coats, or thin layers.

Turbinate; top shaped; resembling an inverted cone.

Turf. The green sward, or grassy sod.

Turgid; swelled, but not inflated.

Turion. A thick, tender young shoot of a plant, as of Asparagus, Hop, &c.

Tussock. A dense tuft or bunch formed at the root, as in some species of Carex, Grasses, &c.

Twin; two of the same kind connected, or growing together.

Twining; winding round and ascending spirally.

Two ranked (or *rowed*). See *distichous*.

Type; a model or form; a pattern individual which unites in itself most completely the characters of a group.

Umbel. A kind of inflorescence, in which the flower stalks proceed from a common centre, like rays, or the braces of an umbrella. Umbels are *simple*, or *compound*, which see.

Umbellate; in the form or manner of an umbel.

Umbellet. A partial umbel; one of the subdivisions of a *compound umbel*: which see.

Umbelliferous; bearing the flowers in umbels.

Umbilicate; navel like; having a central pit, or depression.

Umboate; protuberant, having a boss or elevated point in the centre.

Unarmed; without thorns or prickles.

Uncinate; hook-shaped; hooked at the end.

Undulate; wavy; curved, or rising and depressed, like waves.

Unequal; the parts not corresponding in length, size, form, or duration.

Unguiculate; having a slender or narrow base, like an *unguis*, or claw.

Uniform, or *uniformly*; in one form, or manner; equally and alike.

Unilateral; on one side; growing, or inserted, all on one side of a stem, or common peduncle.

Unisexual; of one sex—*i. e.*, staminate or pistillate, only.

Urcéolate; pitcher-shaped, or urn-shaped; swelling below, and contracted to a neck above.

Utricle. A little sac, or thin membranaceous pericarp, which encloses, but does not adhere to, the seed. See *Caryopsis*.

Valvate æstivation. When the sepals or petals are folded together, and fit by their edges, without overlapping.

Valves. The several parts of a regularly dehiscent pericarp,—especially of a capsule; also, the scales which close the tube, in some corollas; and the chaffy pieces which cover the flowers of the Grasses.

Var. (*Varietas*); a variety or modification of a species.

Variety. A new or unusual form, or modification of a plant, produced by accidental causes,—such as crossing, soil, climate, culture, &c. but not permanently, or at least, not *specifically*, distinct.

Vascular plants. The higher orders of plants (including all above the *Mosses*),—composed more or less of woody fibres, and elongated cells or *vessels*, in the form of slender tubes.

Vaulted; arched over, like the roof of the mouth.

Veins; the elongated vessels of leaves; of ten synonymous with nerves.

Veined; having the vessels variously branching, over the surface.

Venation of a leaf. The distribution of the veins, or frame-work, in the lamina or blade.

Ventral; contained in, or belonging to, the belly.

Ventral suture. The line or seam of a carpel, or folded leaf, formed by the union of its margins; the opposite of *dorsal*.

Ventricose; bellied; swelling out in the middle, or below it.

Vernation. The mode in which young leaves are folded and packed in a bud.

Verrucose; warty; covered with wart like excrescences.

Versatile anther. When it is fixed by the middle on the point of the filament, and moves round lightly and readily,—as in the Grasses &c.

Vertical, or *vertically*; in a perpendicular

- direction; from the zenith, or highest point, directly downwards.
- Vertical* leaves. When they stand edge up, or present their margins—and not their faces—to the earth and sky; indicative rather of *Phyllodia*, than of true leaves.
- Verticil*; a whorl; flowers, leaves, or other organs, arranged in a horizontal ring, round a stem, or at its summit.
- Verticillaster*. A spurious verticil; a condensed cyme, or cluster resembling a verticil,—as in many LABIATÆ.
- Verticillate*; growing or arranged in a verticil, or whorl, or horizontal ring.
- Vesicles*. Little bladder-like vessels.
- Vesicular*, or *vesiculose*; made of, or resembling, little bladders.
- Vespertine* flowers. Those which expand in the evening.
- Vexillum*. The banner, or broad upper petal of a papilionaceous corolla.
- Villose*, or *villous*; velvety; clothed with numerous, and rather long, soft hairs.
- Villus* (plural, *villi*). The velvet-like pubescence on a villous plant.
- Virescent*; inclining to, or becoming, green.
- Virgate*; wand-like; long, slender, and straight.
- Viridescent*; greenish.
- Viscid*; clammy; covered with a sticky or adhesive moisture.
- Viscid pubescent*; with a clammy pubescence.
- Vittæ*. Fillets; linear receptacles of oily matter on the carpels of Umbelliferous plants.
- Viviparous*; producing a collateral offspring by means of bulbs; or having the seeds to germinate before they are detached from the parent plant.
- Voluble*; ascending spirally, or climbing by embracing another object. See *Twining*.
- Wavy*; see *undulate*.
- Whorl*; see *verticil*.
- Winged*; having a thin, extended margin.
- Wings*. The side petals of a papilionaceous corolla; also, the membranous expansion at the summit or margin of certain pericarps, and on the sides of some petioles.
- Woolly*; clothed with a long curled or matted pubescence, resembling wool.

ABBREVIATIONS

OF THE

NAMES OF THE PRINCIPAL AUTHORS QUOTED IN THIS WORK.

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|--|---|
| <i>Ach.</i> Eric Acharius, Swedish Botanist. | <i>Desf.</i> Réne L. Desfontaines, French. |
| <i>Adans.</i> Michel Adanson, French. | <i>De Theis.</i> Alex. de Theis, French. |
| <i>Agardh.</i> Car. Ad. Agardh, Swedish. | <i>Dillen.</i> Joh. Jac. Dillenius, German. |
| <i>Ait.</i> Wm. & Wm. T. Aiton, English. | <i>Don.</i> David & Geo. Don, English. |
| <i>All.</i> Car. Allioni, Italian. | <i>Duby.</i> Jean Etienne Duby, French. |
| <i>A.DC.</i> Alphonse De Candolle, French. | <i>Duham.</i> Hen. L. Duhamel, French. |
| <i>Bartl.</i> Friedr. Gottl. Bartling, German. | <i>Dunal.</i> Michel Felix Dunal, French. |
| <i>Bartr.</i> John & Wm. Bartram, American. | <i>Ehrh.</i> Friedrich Ehrhart, German. |
| <i>Beauv.</i> Palisot de Beauvois, French. | <i>Ell.</i> Stephen Elliott, American. |
| <i>Benth.</i> George Bentham, English. | <i>Endl.</i> Steph Endlicher, Hungarian. |
| <i>Bess.</i> Wilib. Besser, German. | <i>Engelmann,</i> George, American. |
| <i>Blume.</i> Carl Ludw. Blume, German. | <i>Fl. Cestr.</i> Flora Cestrica: By Wm. Darlington, 1 vol. 12mo, 1853. |
| <i>Bronn.</i> Heinr. Geo. Bronn, German. | <i>Forst.</i> George (John, &c.) Forster, English. |
| <i>Brot.</i> Felix Avellar Brotero, Portuguese. | <i>Fries.</i> Elias Fries, German |
| <i>Carey,</i> John, English. | <i>Gaertn.</i> Jos. & Carl Friedr. Gaertner, German. |
| <i>C. A. Mey,</i> Carl Amt. Meyer, German. | <i>Gaudich.</i> M. Ch. Gaudichaud, French. |
| <i>Cass.</i> Alex. Hen. Garb. de Cassini, Italian. | <i>Glox.</i> Benj. Petr. Gloxin, German. |
| <i>Chav.</i> M. Chavannes, French. | <i>Gooden.</i> Saml. Goodenough, English. |
| <i>Chois.</i> Jaq. Denis Choisy, French. | <i>Gray,</i> Asa, American. |
| <i>Colden,</i> Cadwallader, American. | <i>H. B. K.</i> Humboldt, Bonpland, and Kunth. |
| <i>Correa.</i> Abbé Correa de Serra. Portuguese. | <i>Hall, or Haller.</i> Albert von Haller, Dutch. |
| <i>Crantz.</i> Heinr. Joh. Nepom. Crantz, German. | <i>Hoffm.</i> Geo. Fr. (et al.) Hoffmann, German. |
| <i>DC.</i> Aug. Pyramus De Candolle. French. | <i>Hoffmsg.</i> J. C. Count Hoffmannsegg, German. |
| <i>DC. (Alph.)</i> Alphonse De Candolle, French. | <i>Hook.</i> Sir Wm. J. Hooker, English. |
| <i>Decaisne,</i> Joseph, French. | <i>Huds.</i> Wm. Hudson, English. |
| | <i>Jacq.</i> Nich. Joseph Jacquin, German. |
| | <i>Juss.</i> Ant. Laur. de Jussieu, French. |

- Kalm.* Pehr, Swedish.
Koch. Wilh. Dan. Jos. Koch, German.
Kunth. Car. Sigism. Kunth, German.
L. Car. Linnæus, Swedish.
Lam. J. Bapt. Monet de la Marck, French.
Lamb. A. B. Lambert, English.
Less. Chr. Fr. Lessing, German.
Lestib. Fr. Jos. Lestiboudois, Belgian.
Lindl. John Lindley, English.
Link. Heinr. Friedr. Link, German.
Loddig. Conrad Loddiges, English.
Marsh. Humphry Marshall, American.
Mart. Carl Friedr. Phil. von Martius, German.
Medik. Fried. Casim. Medikus, German.
Mey. (C. A.) Carl. Ant. Meyer, German.
Mich. Pet. Ant. Micheli, Italian.
Mill. Philip Miller, English.
Mirb. C. F. Brisseau-Mirbel, French.
Moench. Conrad Moench, German.
Moris. Guiseppe Giacinto, Italian.
Muhl. Henry Muhlenberg, American.
Mc. Andr. Michaux, French.
Neck. Natal. Jos. de Necker, French.
Nees. Chr. Gottfr. Nees von Esenbeck, German.
Nutt. Thomas Nuttall, Anglo-American.
Pers. Chr. Henri Persoon. Dutch?
Pohl. Hans Friederich, German.
Poir. J. L. Marie Poiret, French.
Pursh. Fredk. Pursh.
Presl. Carl Boriwog Presl, Hungarian.
Raf. or Rafin. C. Rafinesque-Schmaltz, Sicilian.
R. Br. Robert Brown, English.
Rich. Louis Claude Richard, French.
Risso. A. Risso, French?
- Roxb.* Wm. Roxburgh, English.
Rumph. Geo. Everh. Rumphius, Dutch.
Salisb. Richd. Anth: Salisbury, English.
Savi. Gaatano, Savi, Italian.
Schott. Heinrich Schott, German.
Schrad. Heinr. Adolph. Schrader, German.
Shreb. Joh. Chr. Dan. von Schreber, German.
Shum. Chr. Fr. Schumacher, German.
Scop. Joh. Ant. Scopoli, Italian.
Ser. Nich. Charles Seringe. Swiss?
Sieb. & Zucc. Siebold and Zuccarini, Dutch?
Smith. Sir James Edward, English.
Sibth. Joh. Sibthorp, English.
Soland. Dan. Conr. Solander, Swedish.
Spreng. Kurt Sprengel, German.
Sw. Olaus Swartz, Swedish.
Theis (De). Alexandre de Theis, French.
Tode. Heinr. Jul. Tode, German.
Torr. & Gr. Jno. Torrey & Asa Gray, American.
Tournef. Jos. Pitton de Tournefort, French.
Trin. Car. Bern. Trinius, German.
Vahl. Martin Vahl, Danish.
Vaill. Sebastian Vaillant, French.
Vent. Etienne Pierre Ventenat, French.
Vill. D. Villars, French.
Walt. Thomas Walter, Anglo-American.
Wangenh. Fr. Ad. Jul. Wangenheim, German.
Weihe. Aug. Weihe, German.
Willd. Carl Ludw. Willdenow, German.
With. Wm. Withering, English.

INDEX

TO THE

NATURAL ORDERS, GENERA AND SPECIES

OF THE PLANTS DESCRIBED OR REFERRED TO IN THIS WORK.

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